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THE MINERAL INDUSTRY of PENNSYLVANIA in 1959

by

Robert D. Thomson
Mary E. Otte
Robert E. Ela

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The Mineral Industry of Pennsylvania

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By Robert D. Thomson [1], Mary E. Otte [2], and Robert E. Ela [3]

PRODUCTION of minerals in Pennsylvania in 1959 continued to decline; total value dropped $18.2 million or 2 percent below 1958. Output in 1959 was the lowest in value since 1942, primarily because of decreases of 8 percent in anthracite and in bituminous coal and 3 percent in petroleum. Increased demand for cement, clay, lime, natural gas, iron ore, sand and gravel, stone, and zinc was not enough to overcome the $44.7 million drop in the three basic fuels.

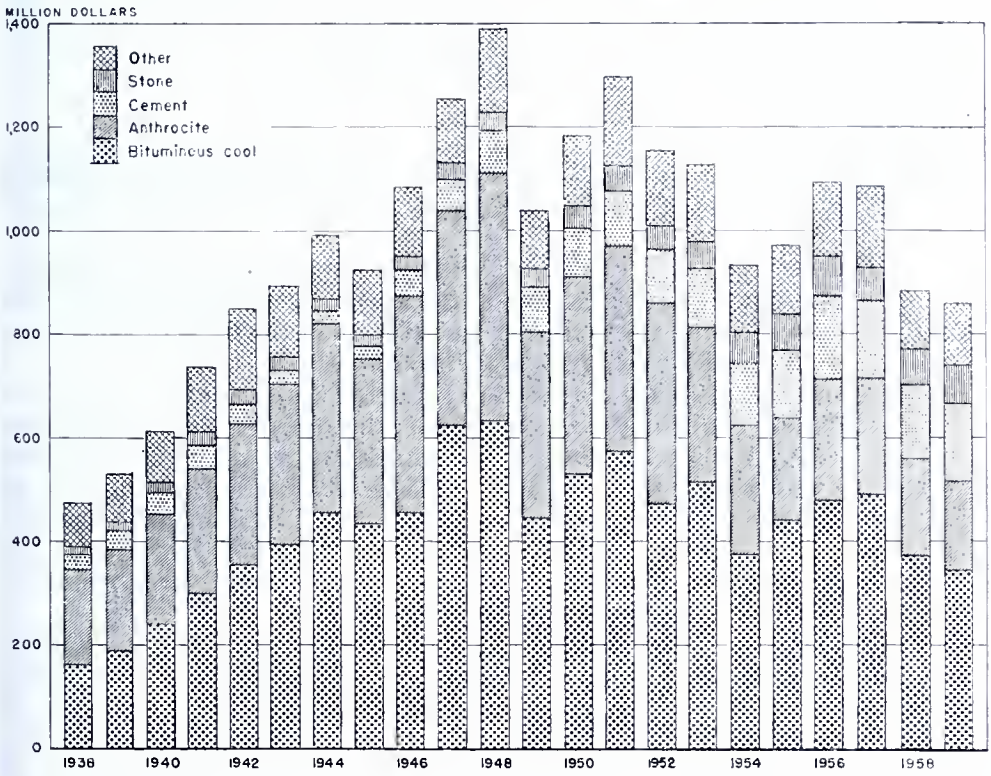

FIGURE 1.—Value of bituminous coal, anthracite, cement, and stone, and total value of mineral production in Pennsylvania, 1938–59.

[1] Supervisory commodity-industry analyst, Region V, Bureau of Mines, Pittsburgh, Pa.
[2] Statistical clerk, Region V, Bureau of Mines, Pittsburgh, Pa.
[3] Statistical assistant, Region V, Bureau of Mines, Pittsburgh, Pa.

TABLE 1.—Mineral production in Pennsylvania [1]

Mineral	1958		1959	
	Short tons (unless otherwise stated)	Value (thousands)	Short tons (unless otherwise stated)	Value (thousands)
Cement:				
Portland 376-pound barrels	40,147,578	$135,118	41,270,129	$143,054
Masonry do	1,967,517	7,281	2,086,499	7,864
Clays	[2] 3,317,600	[2] 17,051	3,466,361	17,196
Coal:				
Anthracite	21,171,142	187,898	20,649,286	172,320
Bituminous	67,770,862	373,812	65,347,088	345,332
Cobalt (content of ore) pounds	564,382	[3]	280,098	[3]
Gem stones	[4]	2	[4]	3
Lime	1,003,058	[5] 14,161	1,263,180	18,261
Natural gas million cubic feet	95,869	27,131	[6] 108,000	[6] 30,700
Natural gas liquids:				
Natural gasoline thousand gallons	1,608	107	2,884	184
LP-gases do	1,363	123	1,484	36
Peat	23,623	203	26,948	262
Petroleum (crude) thousand 42-gallon barrels	6,472	26,535	[6] 6,156	[6] 25,855
Sand and gravel	11,825,024	19,180	14,257,014	23,233
Stone	40,049,162	69,694	43,681,721	77,420
Zinc [7] short tons	10,812	2,229	16,718	3,828
Value of items that cannot be disclosed: Copper, gold, graphite (1959), iron ores (includes crude iron oxide pigments), mica, pyrites, sericite schist, silver, soapstone, tripoli, and values indicated by footnote [3]	----------	[5] 15,960	----------	15,812
Total Pennsylvania [8]	----------	[5] 882,040	----------	863,818

[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producer).
[2] Excludes kaolin; value included with "Items that cannot be disclosed."
[3] Figure withheld to avoid disclosing individual company confidential data.
[4] Weight not recorded.
[5] Revised figure.
[6] Preliminary figure.
[7] Recoverable zinc valued at the yearly average price of Prime Western slab zinc, East St. Louis market. Represents value established after transportation, smelting, and manufacturing charges have been added to the value of ore at mine.
[8] Total adjusted to eliminate duplicating value of clays and stone in manufacturing lime and cement.

Employment and Injuries.—The cement industry (cement plants having no quarry operations) had the lowest frequency rate of the selected mineral industries shown in table 2, reporting only 1 nonfatality for a total of 845,523 man-hours.

A greater number of fatalities were reported for the bituminous-coal industry in 1959 than in 1958. However, the number of nonfatalities decreased from 1,389 to 1,205. The number of fatalities per million man-hours was 0.69, compared with 0.55 in 1958. Per million short tons, the frequency rate was 0.47. The number of nonfatal injuries per million man-hours was 23.18, compared with 23.94 in 1958. Of the fatalities, 17 were from fall of roof, 7 from haulage, 5 from machinery and 4 from electricity.

Fatality experience for the anthracite industry worsened in 1959, as 47 fatalities were reported. The number of nonfatalities decreased from 2,124 to 1,723. The number of injuries per million man-hours of exposure was 1.60 for fatalities and 58.66 for nonfatalities. The number of fatalities per million short tons was 2.29; the number of nonfatalities was 84.07. Eighteen (38 percent) of the 47 fatalities at anthracite mines in 1959 were charged to falls of face, rib, or roof. A major mine inundation was the second ranking cause of fatal injuries, with 12 fatalities (26 percent). Thirteen (72 percent) of the 18

face, rib, or roof-fall accidents were at mines employing 15 or more men underground, and 5 (28 percent) of these fatalities were at mines employing less than 15 men underground. Eleven (61 percent) of the fatalities charged to falls of face, rib, or roof occurred near the face; four (22 percent) by the face area; and three (17 percent) on gangways. Falls of roof rock accounted for 13 of the 18 roof-fall fatalities; falls of rib, 3; and falls of roof coal and face, 1 each. Fatalities from falls of face, rib, or roof, by payroll classification, were eight miners, eight laborers, one timberman, and one assistant mine foreman.

The Stockton mine of the Jeddo-Highland Coal Co. in Luzerne County was the winner of the National Safety Competition for anthracite mines in 1959. The mine was operated for 57,329 man-hours without a lost-time injury. Winners of Certificate of Achievement in Safety for anthracite mines included Loree Nos. 2, 3, 4, and 5; Boston mine; and Eddy Creek Colliery, all operated by The Hudson Coal Co. The winner of the bituminous coal group of the National Safety Competition for 1959 was the Harwick mine operated by Duquesne Light Co. in Allegheny County. This mine was worked 355,088 man-hours without a lost-time injury. The Bowman mine in Westmoreland County, operated by the Bowman Coal Co., received a Certificate of Achievement in Safety. The Bellefonte mine of the National Gypsum Co. in Centre County was awarded a Certificate of Achievement in Safety for its record in the nonmetal group. The mine was worked 212,218 man-hours without a lost-time injury. Also cited for outstanding safety achievements were the G. & W. H. Corson, Inc., Plymouth Meeting lime operation (Montgomery County) the National Gypsum Co. lime operation in York County, and the Pleasant Gap lime plant in Centre County operated by Standard Lime & Cement Co., Division of American-Marietta Co.

TABLE 2.—Employment and injuries for selected mineral industries in 1959 [1]

Commodity	Average number of men working	Total man-hours	Total lost-time injuries		Injuries per million man-hours
			Fatal	Nonfatal	
Anthracite	23,294	29,371,307	47	1,723	60.26
Bituminous coal	34,200	51,990,000	36	1,205	23.87
Cement [2]	353	845,523	----------	1	1.18
Clays	2,470	4,780,508	1	156	32.84
Lime [3]	35	71,008	----------	1	14.08
Sand and gravel	1,542	3,164,980	----------	45	14.22
Stone	9,299	19,881,182	5	333	17.00

[1] Preliminary figures.
[2] Excludes cement operations having quarry operations.
[3] Excludes lime operations having quarry operations.

Consumption, Trade, and Markets.—Most of the mineral commodities produced in Pennsylvania were consumed in the State. Bituminous coal, the State's foremost mineral commodity, was used primarily in local powerplants, for coke production, as residential fuel, and for other industrial uses. The bulk of the anthracite was shipped outside the producing region for electric power generation, residential fuel,

cokemaking, sintering and pelletizing iron ore, and railroad use. The other mineral fuels produced in Pennsylvania—petroleum, natural gas, and natural-gas liquids—were consumed within the State.

Nonmetallic minerals also were important to the economy of Pennsylvania and were largely consumed within the State. Thirty-five percent of the portland cement, 39 percent of the masonry cement, and 61 percent of the lime were consumed locally. Clay production was primarily captive tonnage for use in manufacturing refractories and heavy clay products. Stone and sand and gravel were used near the producing sites for construction and paving projects. In addition, large quantities of industrial sand, slate, and fluxing stone were produced.

Metallic ores were produced in the southeastern part of the State. However, the consuming industries, such as steel, relied chiefly on shipments of ore from other States and foreign deposits.

Legislation and Government Programs.—In 1959 five projects were approved under the Federal-State program for controlling mine water in the anthracite regions. Three projects were surface-drainage improvements, and two were pump installations, one of which was cancelled during the year. Thirteen projects had been completed since the program was initiated in 1955. Nine projects were in varying stages of construction or undergoing final tests. Ten of the projects required a total of 29 deep-well pumps with an aggregate capacity of 143,000 gallons per minute. The remaining 12 projects provided such surface-drainage improvements as backfilling old strip pits and the construction of ditches and flumes.

On January 22, 1959, the Susquehanna River, in flood stage, broke into mine workings near Wilkes-Barre. The water spread through adjacent mines and flooded workings underlying about 5 square miles of surface area. Emergency funds, made available by a disaster proclamation, were used to obtain pumping equipment from the mine-water control program and to obtain other large-capacity pumps to unwater the flooded mines. The underground pool was lowered nearly 300 feet in order to conduct recovery operations and permanently seal the breakthrough point.

REVIEW BY MINERAL COMMODITIES

MINERAL FUELS

Anthracite.—The output of anthracite again decreased, totaling 20.6 million short tons, a reduction of 2 percent from 1958. The decline in production in 1959 was partly due to a 500,000-ton drop in exports. Apparent consumption in the United States fell only 1 percent, as the decline in shipments of the larger sizes was almost offset by increased shipments of Buckwheat Nos. 4 and 5 and "other." The percentages contributed by the various sources changed sharply, owing to the differences in market demand for individual sizes and the mine-flood disaster in the northern field, which destroyed underground productive capacity estimated at 1.4 million tons annually.

Underground production dropped from 51 to 46 percent of the total output. Output from strip mines increased from 32 to 34 percent and

culm-bank production rose from 14 to 17 percent. Dredge production represented 3 percent of the total in both years.

The same percentage of the coal produced underground was loaded by hand as in 1958; 4.7 million short tons were hand-loaded in 1959, compared with 5.4 million in 1958. A total of 4.7 million tons was loaded mechanically in 1959, compared with 5.3 million tons in 1958. In all, 186 scraper loaders (104 less than 1958), 46 mobile loaders (5 less than in 1958), and 869 conveyors and pit-car loaders (365 less than in 1958) were used to mechanically load coal underground. Production from strip pits increased 3 percent in 1959, totaling 7.1 million tons. A total of 168 power shovels and 233 draglines were used in stripping Pennsylvania anthracite and in the recovery of culm banks. This compares with 179 and 245, respectively, in 1958. Production from culm banks totaled 3.4 million tons, and by dredge 717,000 tons, increases of 18 and 4 percent, respectively. Production from culm banks came from the Lehigh, Schuylkill, and Wyoming regions and Sullivan County; the largest output came from Schuylkill region. Anthracite was recovered from the Lehigh, Schuylkill, and Susquehanna Rivers. Average value per ton for dredged anthracite increased from $1.92 to $3.22.

Apparent consumption continued to decrease, declining 200,000 tons to 18.8 million tons. A total of 15.7 million tons of anthracite was shipped outside the producing area (3 percent less than in 1958), whereas 4.8 million tons was sold to local trade and 129,000 tons was sold as colliery fuel. Overall shipments in 1959 were 2 percent less than in 1958. According to the Pennsylvania Department of Mines and Mineral Industries, 9.8 million short tons of anthracite was shipped by rail; 28 percent went to New York, 12 percent to New Jersey, and 25 percent to consumers in Pennsylvania. Truck shipments totaled 8.7 million tons; 15 percent was shipped to New York, 7 percent to New Jersey, and 76 percent to points in Pennsylvania (45 percent within the producing region and 31 percent outside the producing region). Average value per ton of anthracite was $8.53 for that shipped outside the producing regions, $7.80 for local sales, and $5.97 for colliery fuel, compared with $9.02, $8.51, and $6.33, respectively, in 1958.

The average number of men working daily totaled 23,294, 3,246 less than in 1958. The average number of days active was 173, compared with 183 in 1958. Output per man per day for all types of operations was 5.12, compared with 4.36 in 1958.

Schuylkill County's anthracite production, 7.9 million tons, continued to be the greatest in Pennsylvania. Luzerne County was the second-ranking county with a production of 6.2 million tons. Other counties producing anthracite (in order of decreasing tonnage) were Northumberland, Lackawanna, Columbia, Lancaster, Carbon, Dauphin, Snyder, Lebanon, Northampton, Sullivan, and Wayne.

Bituminous Coal.—Output from the Pennsylvania bituminous coalfields continued to decline. The number of mines in operation also decreased. Thirty-six percent less coal was produced in 1959—a drop in production of 2.4 million tons. The index of coal production dropped to 53 (1947–49=100) from 55 in 1958 and 68 in 1957.

In 1959, 1,383 mines producing 1,000 tons or more were active (29 less than in 1958). The number of active underground mines decreased from 809 to 756, strip mines increased from 565 to 589, and auger mines remained the same at 38.

Approximately 68 percent of the bituminous-coal output came from underground mines; this was 3.2 million tons less than in 1958. Of the total underground output, 43.7 million tons was cut by machines, including the proportion mined by continuous miners; the remainder was cut by hand or shot from the solid. In all, 1,314 cutting machines and 306 continuous miners were used. Locomotives (2,165), animals (526), mother conveyors (316), shuttle cars (1,126), and rope hoists (608) were used for underground haulage. Pennsylvania underground production continued to be characterized by highly mechanized operations, with 93 percent of the underground production mechanically loaded by 1,224 machines. Mobile loaders were the primary moving device, loading 14,057,000 tons into shuttle cars, 2,104,000 tons into mining cars, and 690,000 tons onto conveyor belts. Handheld and post-mounted drills as well as mobile drills were used underground; 14.5 million tons of coal was drilled with 1,185 handheld or post-mounted drills, and 5.5 million tons of coal was drilled with 125 mobile drills.

Pennsylvania output by strip mining increased approximately 600,000 tons. Bituminous coal was stripped and loaded, using electrical, diesel-electric, diesel, and gasoline power shovels and draglines. Of the 974 power shovels in use (6 more than in 1958), 914 had a capacity of less than 3 cubic yards; 57, 3 to 5 cubic yards; and 3, more than 12 cubic yards. A total of 385 draglines was used (8 more than in 1958); 153 had a capacity of less than 3 cubic yards; 143, 3 to 5 cubic yards; 82, 6 to 12 cubic yards; and 7, more than 12 cubic yards. A total of 21 carryall scrapers (3 less than in 1958) was used; 10 had a capacity of over 12 cubic yards; 5, 6 to 12 cubic yards; 3, 3 to 5 cubic yards; and 3, less than 3 cubic yards. In addition, 877 bulldozers (44 more than in 1958), 141 horizontal power drills, and 130 vertical power drills were used.

Bituminous coal produced from underground mines was shipped primarily by rail (87 percent) and truck (9 percent). A major portion of the underground production (53 percent) was captive. The average value per ton of coal produced underground was $6.01, with an average value of $5.33 for coal sold on the open market. Truck shipments of strip coal to consumers totaled 7.5 million tons, representing 37 percent of the strip-mine production. The average value per ton of strip-mine coal was $3.73, 13 cents lower than in 1958. Strip-mine coal sold on the open market was valued at $3.70 per ton and captive production was valued at $5.10.

There were 38 auger mines active in 1959. More than 61 percent of the auger-mine production was shipped by rail. Auger coal was sold at an average value of $3.19 per ton.

Eighty-five preparation plants were active, compared with 94 in 1958. These plants produced 37.4 million tons of clean coal; 89 percent came from underground mines, and 11 percent from strip mines. Of the mine production mechanically cleaned, 88 percent was wet washed (17 percent by jigs and 71 percent by other wet methods) and 12 percent was cleaned by pneumatic methods.

At the mines having crushing facilities, 28.9 million tons was crushed; this amount was 60 percent of the tonnage produced at these mines. The total output from mines having treatment facilities was 23 million tons. Of this total, 6.2 million tons was treated—708,000 tons with calcium chloride, 4 million tons with oil, 342,000 tons with both calcium chloride and oil, and slightly over 1 million tons with other materials.

Bituminous coal was produced in 28 counties in 1959. Washington County was the leading county for production from underground mines, followed by Cambria, Indiana, Westmoreland, Fayette, Armstrong, and Clearfield Counties. Clearfield County led in production from strip mines, followed by Clarion, Butler, Armstrong, Indiana, and Somerset. Armstrong led in the production of auger mines followed by Clearfield, Butler, Washington, Jefferson, Cambria, Elk, and Somerset Counties.

TABLE 3.—Bituminous-coal production, by types of mining and counties, 1959

County	Underground		Strip		Auger	
	Number of mines	Short tons	Number of mines	Short tons	Number of mines	Short tons
Allegheny	29	4,204,057	27	562,506	----------	----------
Armstrong	58	1,234,329	36	1,312,151	9	160,080
Beaver	4	18,938	24	252,465	----------	----------
Bedford	24	99,841	4	61,351	----------	----------
Blair	(1)	(1)	(1)	(1)	----------	----------
Bradford	----------	----------	1	6,798	----------	----------
Butler	28	234,917	38	1,736,035	3	37,438
Cambria	92	6,736,821	27	481,595	1	14,957
Cameron	----------	----------	1	50,887	----------	----------
Centre	17	51,112	18	670,026	1	4,263
Clarion	12	68,715	31	2,832,050	1	4,212
Clearfield	88	1,142,700	106	4,846,473	9	58,950
Clinton	4	14,788	6	623,816	----------	----------
Elk	19	158,593	7	133,890	2	14,937
Fayette	41	2,348,913	31	335,352	----------	----------
Greene	19	9,636,015	3	7,243	----------	----------
Huntingdon	9	18,073	5	44,266	----------	----------
Indiana	83	5,123,486	33	1,031,364	3	44,243
Jefferson	30	218,768	29	660,661	4	15,401
Lawrence	1	6,300	28	995,981	----------	----------
Lycoming	3	14,233	2	42,870	----------	----------
McKean	----------	----------	3	42,293	----------	----------
Mercer	3	41,143	7	483,437	----------	----------
Somerset	103	947,695	54	1,100,925	2	14,778
Tioga	(1)	(1)	(1)	(1)	----------	----------
Venango	----------	----------	13	552,260	----------	----------
Washington	(1)	(1)	21	974,903	(1)	(1)
Westmoreland	(1)	(1)	23	160,016	1	1,029
Undistributed	89	12,322,728	11	305,372	2	27,649
Total	756	44,642,165	589	20,306,986	38	397,937

[1] Figure withheld to avoid disclosing individual company confidential data; included with "Undistributed."

Coke and Coal Chemicals.—Pennsylvania continued to rank first in the United States in output of beehive and oven coke. Production from oven-coke operations decreased 2 percent or 213,000 short tons, primarily due to a 116-day steel strike. However, production of beehive coke was double that of 1958, totaling 713,000 tons.

Fourteen plants, operating 4,133 slot-type ovens (35 less than operated in 1958), carbonized 19.9 million short tons of coal to produce 13.8 million tons of oven coke. Yield of coke from coal was 69.19 percent. The average value of oven coke at the ovens was $16.56 per ton, compared with $16.92 in 1958. Of the oven coke produced in Pennsylvania, 92 percent was used by the producers in blast furnaces, and 4 percent was sold to consumers for use in blast furnaces. The remainder was used principally by foundries and to make producer gas and water gas.

A total of 1,141,000 tons of coal was carbonized in 6,080 beehive ovens (1,236 less than in 1958) to produce 713,000 tons of coke. Yield of coke from coal increased from 61.14 percent to 62.52 percent. The average value of beehive coke at the ovens was $14.60 a ton, compared with $13.46 in 1958. The beehive coke was sold for use in blast furnaces (79 percent of 1959 production), by foundries, for residential heating, and for other industrial uses.

Coal produced in Kentucky, Pennsylvania, Virginia, and West Virginia was used at oven-coke plants in Pennsylvania. Most of the coal (57 percent) came from mines in Pennsylvania. Seventy-six percent of the coal used at coke-oven plants was high-volatile, 9 percent medium-volatile, and 15 percent low-volatile.

A total of 210 billion cubic feet of coke-oven gas was produced in Pennsylvania; 39 percent was used in heating ovens, 60 percent was surplus used or sold, and 1 percent was wasted. Thirteen plants produced coke-oven ammonia having a yield of 194,683 short tons of sulfate equivalent. A total of 191 million gallons of coke-oven tar was produced in 1959; 109 million gallons was used by producers for refining or topping, 34 million gallons as fuel, and 42 million gallons sold for refining into tar products. Crude light oil totaling 58 million gallons was produced at 14 oven-coke plants. Plants in Pennsylvania also produced benzene (32 million gallons), toluene (8 million gallons), xylene (2.7 million gallons), and solvent naphtha (1.8 million gallons).

Peat.—Pennsylvania ranked sixth among the 19 peat-producing States; production and value of output increased 14 and 29 percent, respectively. Producers of humus and reed-sedge were active in order of decreasing importance, in Luzerne, Lawrence, Wayne, and Erie Counties. Production was not reported from Mercer County in 1959.

Petroleum and Natural Gas.—Output of crude petroleum continued to decrease, although Pennsylvania remained the 19th-ranking producer. Output decreased 5 percent in quantity and 3 percent in value. The average value of crude petroleum was $4.20 per barrel, 10 cents more than in 1958.

Pennsylvania ranked 10th in national gas production, showing an increase of 13 percent. The value of natural-gas production also increased to 28.4 cents per thousand cubic feet.

The number of wells completed in Pennsylvania again declined, dropping to 648. Of this total, 160 were oil wells, 327 gas wells, 67 dry holes, and 94 service wells. Wildcat wells completed totaled 25 less than in 1958. Of this total, 17 were dry holes, and 4 were new gas pools. Completed field wells totaled 627—1 more than in 1958. Of this number, 160 were crude-oil wells, 323 gas wells, 50 dry holes, and 94 service wells.

Total footage for completed wells was 2,078,276—an average of 3,207 feet. Footage for completed field wells was 1,967,287 and for wildcat wells, 110,989. Of the gas-well completions in 1959, 323 were field wells, and 4 were wildcat wells. This was 46 more than were placed in operation in 1958.

The proved recoverable crude-oil reserve in Pennsylvania was estimated at 113.6 million barrels as of December 31, 1959—6.3 million barrels less than was reported in 1958. The proved recoverable reserve of natural gas in Pennsylvania was 1,052,000 million cubic feet as of December 31, 1959, 182,000 million more than on December 31, 1958. Of the natural-gas reserves, 622,676 million cubic feet was nonassociated reserves, 25,040 million was dissolved, and 404,256 million was stored in underground reservoirs.

Natural-Gas Liquids.—Natural-gas liquids produced in Pennsylvania in 1959 totaled 4,368,000 gallons valued at $220,000. Output consisted of liquefied petroleum gas (manufactured at natural-gasoline plants) totaling 1,484,000 gallons and natural-gasoline and cycle products totaling 2,884,000 gallons. Average value for liquefied petroleum gases was 2.4 cents per gallon and for natural gasoline and cycle products, 6.4 cents. Reserves of natural-gas liquids as of December 31, 1959, were estimated at 3.7 million barrels—8,000 barrels less than at the end of 1958.

NONMETALS

Cement.—Activity in the Pennsylvania cement industry increased during 1959. Kilns operated at approximately 72 percent of capacity and produced 41 million barrels of portland cement. Shipments of portland and masonry cement increased 3 percent in quantity and 6 percent in value. Shipments in 1959, however, were 17 percent lower than the peak year of 1956. Portland cement was shipped to consumers in Pennsylvania, 39 other States, and the District of Columbia; 22 percent went to New York, 22 percent to New Jersey; 5 percent to Connecticut, 5 percent to Ohio, 3 percent to Maryland, and 2 percent to Massachusetts.

Masonry cement shipments, chiefly from Lehigh and Northampton Counties, increased. Masonry cement was shipped to 27 States and the District of Columbia. Thirty-nine percent was consumed in Pennsylvania, 18 percent in New Jersey, 16 percent in New York, and 11 percent in Ohio.

The principal raw materials used for manufacturing portland cement were cement rock and limestone. Totals of 8.4 million short tons of cement rock and 3.2 million tons of limestone were used. In addition, the following tonnages of raw materials were used: Gypsum, 307,304; sand, 180,729; slag, 276,902; clay, 114,155; and iron materials. 65,036. Slate, carbon black, flue dust, flint rock, and air-entraining compound also were used.

The capacity of the 24 active plants totaled 57 million barrels—73 percent by the dry process and 27 percent by the wet process. The industry consumed 974 million kilowatts of electrical energy, about 11 million kilowatts less than in 1958. Sixty-eight percent of the electrical energy was purchased from public utility companies. Stocks of portland cement decreased from 5.6 million barrels at the beginning of the year to 5.4 million barrels at yearend.

TABLE 4.—Shipments of portland cement, by counties

County	Number of plants in 1959	1958		1959	
		Barrels	Value	Barrels	Value
Lehigh	4	6,599,198	$21,769,945	6,859,370	$23,411,844
Northampton	12	19,957,871	66,432,924	20,388,750	70,617,280
Allegheny	2	7,128,370	24,317,578	7,086,699	23,991,959
Lawrence	2				
Berks	1	6,462,139	22,597,610	6,935,310	25,032,809
Butler	1				
Montgomery	1				
York	1				
Total	24	40,147,578	135,118,057	41,270,129	143,053,892

Clays.—A sharp rise in consumption of refractories overcame a drop in demand for clay by the cement and heavy-clay-products industries. Consequently, there was a 3-percent increase in the output of clay.

The production of fire clay increased 17 percent over 1958 but was 26 percent lower than the peak production of 1956. The increase was due to a 26-percent rise in the demand for refractory materials by the steel, glass, and foundry industries and a 3-percent increase in the demand for fire clay for heavy clay products. Clearfield County was the leading county for the production of fire clay in 1959, followed by Beaver and Jefferson Counties. Clearfield County also led in the number of operations—21 open pits and 8 underground mines. Altogether 85 fire-clay mines operated in the State; 53 were open pit and 32 were underground mines.

Production of miscellaneous clay continued to decline with tonnage 8 percent lower than in 1958. Lower demand for miscellaneous clay for heavy clay products, cement, and lightweight aggregate contributed to the decline. Berks County was the leading producer of miscellaneous clay, followed, in decreasing order, by Allegheny, Northumberland, and Schulykill Counties.

Output of kaolin decreased. Kaolin was used to produce firebrick and block and portland cement with all uses demanding smaller quantities than in 1958. All output was produced in Cumberland and Blair Counties.

Clay was produced in 34 counties, 1 less than in 1958 and 3 less than in 1957. Fire clay was produced in 19 counties and miscellaneous clay in 26 counties (1 less than in 1958).

TABLE 5.—Clays sold or used by producers, by kinds and uses, in short tons

Uses	Fire clay		Miscellaneous clay		Kaolin	
	1958	1959	1958	1959	1958	1959
Refractories:						
Bauxite, high-alumina brick	4,000	[1]				
Firebrick and block	598,320	716,258		622	[2]	4,745
Fire-clay mortar	12,516	20,575				
Clay crucibles	8,669	[1]				
Foundries and steelworks	65,794	101,747	[1]	[1]		
Heavy clay products	773,295	795,058	1,414,282	1,309,546		
Lightweight aggregate			103,740	[1]		
Cement			232,120	202,359	[2]	24,862
Undistributed	81,681	169,531	23,183	121,058		
Total	[3] 1,544,275	[3] 1,803,169	[4] 1,773,325	[4] 1,633,585	[2]	29,607

[1] Included with "Undistributed" to avoid disclosing individual company confidential data.
[2] Figure withheld to avoid disclosing individual company confidential data.
[3] Includes art pottery and stoneware (1958), floor and wall tile (1959), glass and miscellaneous refractories and items indicated by footnote 1.
[4] Includes art pottery and stoneware, floor and wall tile, foundries and steelworks, linoleum and oilcloth, miscellaneous filler (1958), other uses, and items indicated by footnote 1.

TABLE 6.—Clays sold or used by producers in 1959, by counties and uses

(X's indicate counties in which specific uses exist)

Area and county	Short tons	Value	Type of mining		Types of clay												
					Fire clay					Miscellaneous clay						Kaolin	
					Heavy clay products			Refractories	Other	Heavy clay products			Pottery	Cement	Other	Refractories	Cement
			Underground	Open pit	Building brick	Vitrified sewer pipe	Other			Building brick	Vitrified sewer pipe	Other					
Northwestern Pennsylvania:																	
Clarion	318,827	$1,902,808	4	2	X		X	X		X		X					
Jefferson			3	1	X	X	X	X			X						
Lawrence	272,063	685,492		5	X		X			X				X	X		
Total northwestern Pennsylvania	590,890	2,588,300	7	8													
Southwestern Pennsylvania:																	
Allegheny	148,240	780,169		7						X		X					
Armstrong	232,045	2,519,679	6	2	X	X	X	X									
Beaver	382,909	1,918,568	4	7	X	X		X	X	X			X		X		
Butler	59,917	186,820		4				X		X				X			
Indiana			1					X									
Fayette	123,256	767,924		4	X			X		X		X			X		
Somerset	81,376	627,205	3	2	X			X									
Washington	40,790	45,257		3						X							
Total southwestern Pennsylvania	1,068,533	6,845,622	14	29													
North central Pennsylvania:																	
Centre	(1)	(1)		1				X									
Clinton	(1)	(1)		2				X				X					
Elk	(1)	(1)		1		X											
Clearfield	478,476	3,179,984	8	21	X	X		X		X	X						
McKean	56,718	242,287		3		X		X		X					X		
South central Pennsylvania:																	
Blair	(1)	(1)		4				X		X						X	
Cumberland	(1)	(1)		1													X
Dauphin	(1)	(1)		3						X					X		
Huntingdon	(1)	(1)		2				X									
Northumberland	(1)	(1)		3						X					X		

Snyder	(1)	(1)		2					X								
York	(1)	(1)		2						X				X			
Adams	71,970	36,660		2						X		X					
Cambria	42,376	190,383	3	1	X	X		X		X							
Undistributed [2]	512,322	2,361,263															
Total north central and south central Pennsylvania	1,161,862	6,010,577	11	48													
Northeastern Pennsylvania:																	
Monroe	(1)	(1)		1										X			
Columbia	14,670	(1)		1								X					
Luzerne	44,672	(1)		1						X							
Southeastern Pennsylvania:																	
Berks	(1)	(1)		2						X							
Bucks	(1)	(1)		1						X							
Lancaster	(1)	(1)		3				X		X							
Schuylkill	(1)	(1)		2						X					X		
Chester	80,528	(1)		1						X							
Montgomery	66,022	(1)		4		X				X	X	X	X				
Undistributed [2]	439,184	1,751,526															
Total northeastern and southeastern Pennsylvania	645,076	1,751,526		16													
Grand total	3,466,361	17,196,025	32	101													

[1] Included with "Undistributed" to avoid disclosing individual company confidential data.
[2] Includes tonnage and value for counties that must be concealed as indicated by footnote 1.

Gem Stones.—The value of gem stones, including mineral specimens, was higher than in 1958. Eastern Pennsylvania, particularly Monroe, Chester, Montgomery, and Berks Counties, continued to be the most popular area for gem materials. Most of the mineral specimens were collected by members of Pennsylvania and out-of-State mineral and lapidary clubs.

Graphite, Crystalline.—Flake graphite was recovered from schist in Chester County for the first time since 1953 and marketed as crucible flake and fine flake. In addition, manufactured (artificial) graphite powder and products were produced at a plant in St. Marys. The graphite powder was sold to major steel and chemical companies.

Iron Oxide Pigments.—Output of crude iron oxide pigments decreased in tonnage and value. Production came from Cambria and Allegheny Counties. Most of the production was sulfur mud from Cambria County. Pennsylvania continued to be the leading State in the production of finished natural and manufactured iron oxide pigments. Output increased 16 percent in tonnage and 17 percent in value. The greater production was attributable primarily to the output of manufactured red iron oxide pigments, natural red iron oxide, natural brown iron oxide, and manufactured yellow iron oxide. Brown iron oxide, burnt umber, and red iron oxide were the principal finished natural iron oxide pigments; and red iron oxide, yellow iron oxide, and Venetian red were the principal manufactured iron oxide pigments. Finished natural and manufactured iron oxide pigments were produced at one plant in Carbon County and two plants at Northampton County.

Lime.—Production of lime increased 26 percent, owing largely to a greater demand for lime by chemical and refractory industries. Thirty-one percent more lime was sold for agricultural and refractory uses than in 1958 and 27 percent more for chemical and industrial uses. Of the total sold or used, 78 percent was quicklime, compared with 74 percent in 1958, and 22 percent was hydrated lime, compared with 26 percent in 1958. Most of the lime was consumed within the State (61 percent), but large quantities were shipped to Maryland (8 percent), New Jersey (7 percent), Ohio (7 percent), New York (6 percent), Delaware (3 percent) and Maine (2 percent).

Twenty companies operated 23 plants in 16 counties in 1959. Centre County continued as the leading producer with 48 percent of the State's lime production. Centre, Chester, Lebanon, Montgomery, and York Counties each had an output of over $1 million. Approximately 2.5 million short tons of limestone was used in producing lime.

TABLE 7.—Lime sold by producers, by uses

	Agricultural		Building		Chemical and industrial		Refractory		Total	
	Short tons	Value (thousands)	Short tons	Value (thousands)	Short tons	Value (thousands)	Short tons	Value (thousands)	Short tons	Value (thousands)
1950–54 (average)	129,351	$1,486	123,730	$1,727	768,508	$8,682	155,894	$2,101	1,177,483	$13,996
1955	118,274	1,430	118,727	1,530	1,083,043	13,179	104,007	1,493	1,424,051	17,632
1956	360,718	5,140	110,344	1,456	972,368	11,686	(1)	(1)	1,443,430	18,282
1957	286,720	4,469	110,815	1,874	900,866	12,063	(1)	(1)	1,298,401	18,406
1958	193,433	3,077	112,437	1,839	697,188	[2] 9,245	(1)	(1)	1,003,058	[2] 14,161
1959	253,313	4,023	121,308	2,166	888,559	12,072	(1)	(1)	1,263,180	18,261

[1] Refractory lime included with "Agricultural" to avoid disclosing individual company confidential data.
[2] Revised figure.

TABLE 8.—Lime sold by producers, by counties

County	1958		1959	
	Short tons	Value	Short tons	Value
Armstrong	1,019	$11,190	816	$11,466
Centre	462,771	[1] 6,236,702	600,951	8,069,886
Dauphin	9,866	126,062	8,700	121,800
Franklin	2,046	15,549	1,887	14,241
Fulton	495	4,455	874	7,866
Juniata			2,200	22,000
Lebanon	151,059	1,912,460	201,000	2,810,000
Mifflin	5,656	65,589	6,670	75,278
Northumberland	420	3,682	400	4,000
Snyder	1,301	9,755	1,289	9,793
Undistributed [2]	368,425	5,775,195	438,393	7,114,506
Total	1,003,058	[1] 14,160,639	1,263,180	18,260,836

[1] Revised figure.
[2] Includes tonnage and value for the following counties: Bedford, Blair (1958), Butler, Chester, Lancaster, Montgomery, and York.

Magnesium Compounds.—Magnesium carbonate produced from dolomite at Plymouth Meeting was used to make magnesium oxide for insulation purposes. Operations were discontinued at the Keasbey & Mattison Co. Ambler Plant in 1958.

Mica.—Output of mica continued to decrease primarily because of a lower demand for ground mica for use by paint and rubber industries. The mica was mined and processed near Glenville and marketed for use in paints, mold lubricant for the rubber industry, as a filler in plastics, and for use in welding rods.

Perlite (Expanded).—Output of expanded perlite totaled 18,418 tons valued at $1,090,306, increases compared with 1958 of 27 and 37 percent, respectively. The increased output was due primarily to greater demand for expanded perlite as an aggregate in building plaster and

insulation. Smaller quantities were consumed as concrete aggregate, soil conditioner, filler, and filter aid.

Pyrite.—Output of pyrite decreased 22 percent. The pyrite was obtained as a byproduct of iron-ore mining in eastern Pennsylvania. The pyrite concentrate obtained at Bethlehem was processed to recover pyrite and cobalt.

Roofing Granules.—The output of roofing granules increased in tonnage and value, owing to an increased demand for both natural granules and artificially colored granules. Slate, stone, and clay were used to produce roofing granules. Of the total production, artificially colored granules represented 74 percent, compared with 87 percent in 1958.

Sand and Gravel.—The sand and gravel industry recorded its best year since 1953 with an increase of 21 percent in tonnage and value. However, production was 9 percent below the record established in 1951. The value of sand and gravel had increased $0.40 per ton in 10 years. Pennsylvania ranked 15th in tonnage and 8th in value of sand and gravel. Commercial production was reported from 43 counties. Government-and-contractor operations were reported from Clinton, Lancaster, and Susquehanna Counties. Bucks County continued as the leading producer of sand and gravel, showing a substantial gain over the previous year. The seven southeastern counties (Berks, Bucks, Lancaster, Montgomery, Northampton, Philadelphia, and Schuylkill) contributed 38 percent of State tonnage and 32 percent of the value.

Construction of the Stillwater flood-control dam by Booth & Flinn Co., Pittsburgh, Pa., stimulated activity in northeastern Pennsylvania. The central region of the State remained the chief source of industrial sands, showing increases of 19 percent in tonnage and 28 percent in value. More than 84 percent of the sand and gravel was produced by 33 of the 98 commercial producers, each producing over 100,000 tons.

Of the total commercial sand and gravel production, 10, 26, and 64 percent was transported by rail, water, and truck, respectively.

More than 55 percent of the output was for structural uses and 30 percent for paving purposes. Industrial sands kept pace with the growth of the sand and gravel industry, recording increases of 21 percent in tonnage and 20 percent in value.

TABLE 9.—Sand and gravel sold or used by producers, by uses

Use	1958		1959	
	Short tons	Value	Short tons	Value
COMMERCIAL OPERATIONS				
Sand:				
Molding	151,243	$457,555	173,104	$483,130
Building	3,488,941	4,931,685	3,824,920	5,476,084
Paving	1,878,762	2,809,596	2,148,497	3,218,653
Fire or furnace	(1)	(1)	105,868	380,094
Engine	53,451	110,612	77,213	192,675
Otber	165,506	428,360	(1)	(1)
Undistributed [2]	840,095	3,214,234	1,355,703	4,566,873
Total	6,577,998	11,952,042	7,685,305	14,317,509
Gravel:				
Building	3,258,596	4,593,614	4,037,098	5,385,540
Paving	1,707,011	2,442,856	2,200,930	3,270,382
Undistributed [3]	119,830	112,688	301,295	247,053
Total	5,085,437	7,149,158	6,539,323	8,902,975
Total sand and gravel	11,663,435	19,101,200	14,224,628	23,220,484
GOVERNMENT-AND-CONTRACTOR OPERATIONS				
Sand:				
Building			50	180
Paving	161,589	78,770		
Total	161,589	78,770	50	180
Gravel: Fill			32,336	12,385
Total			32,336	12,385
Total sand and gravel	161,589	78,770	32,386	12,565
Grand total	11,825,024	19,179,970	14,257,014	23,233,049

[1] Included with "Undistributed" to avoid disclosing individual company confidential data.
[2] Includes glass, grinding and polishing, blast (1959), filter (1958), and ground sand.
[3] Includes railroad ballast and other uses.

TABLE 10.—Sand and gravel sold or used by producers in 1959, by counties and areas

(X's indicate counties in which specific uses exist)

Area and county	Short tons	Value	Sand									Gravel				Miscellaneous	Type of operation		Transportation		
			Construction				Industrial					Construction					Stationary	Portable	Rail	Water	Truck
			Building	Paving	Fill	Other	Glass	Molding	Grinding and polishing	Fire and furnace	Other	Building	Paving	Fill	Other						
Northwestern Pennsylvania:																					
Crawford	142,330	$179,678	X	X								X	X	X	X	X	4				X
Erie	260,322	342,261	X	X				X				X	X		X	X	4		X		X
Forest	539,980	996,091	X	X								X	X				1				X
Venango			X	X		X		X		X		X	X	X	X	X	3		X		X
Warren			X	X								X	X				2				X
Lawrence	691,054	980,816	X	X							X	X	X	X			2				X
Mercer			X	X	X	X						X	X			X	4				X
Total	1,633,686	2,498,846															20				
Southwestern Pennsylvania:																					
Allegheny	1,854,923	3,579,908	X	X	X			X				X	X	X			2	1	X	X	X
Armstrong			X	X		X						X	X	X	X	X	2		X		X
Beaver			X	X								X	X	X			2			X	X
Butler	133,780	193,618	X	X	X							X	X			X	2				X
Fayette	162,000	397,000	X	X								X	X					1	X	X	X
Somerset	990	2,870	X	X		X						X	X				2				X
Total	2,151,693	4,173,396															10	2			
North Central Pennsylvania:																					
Clearfield	(1)	(1)	X	X								X	X				1				X
Clinton	(1)	(1)												X				1			X
Elk	(1)	(1)	X	X								X	X					1			X
Lycoming	(1)	(1)	X	X				X			X	X	X		X		2		X		X
McKean	(1)	(1)	X	X				X				X	X				1				X
Total																	4	2			

South Central Pennsylvania:																					
Bedford	(1)	(1)	X	X								X	X				1				X
Blair	(1)	(1)	X	X								X	X				2				X
Dauphin	(1)	(1)	X	X								X	X				2				X
Fulton	(1)	(1)	X	X								X	X				1				X
Huntingdon	(1)	(1)	X	X			X	X	X		X	X	X				2		X		X
Mifflin	(1)	(1)	X	X			X	X	X	X	X	X	X				3		X		X
York	(1)	(1)	X	X						X		X	X				3		X		X
Cambria	8,000	26,000	X	X		X					X	X	X				1				X
Cumberland	171,778	313,370	X	X								X	X				3				X
Franklin	145,311	216,946	X	X		X						X	X				2	1			X
Northumberland	6,978	8,853	X	X	X			X				X	X				2		X		X
Undistributed [2]	2,846,307	6,485,252																			
Total	3,178,374	7,050,421															22	1			
Northeastern Pennsylvania:																					
Bradford	46,500	63,000	X	X								X	X					1			X
Carbon	224,523	331,898	X	X							X	X	X				3		X		X
Columbia	554,513	635,043	X	X								X	X				2				X
Wyoming			X	X		X					X	X	X	X			2	1			X
Luzerne	450,930	553,192	X	X								X	X				5	1			X
Monroe	172,294	231,003	X	X								X	X				2				X
Wayne			X	X		X						X	X				2				X
Susquehanna	478,500	287,100	X	X								X	X					1			X
Total	1,927,260	2,101,236															16	4			
Southeastern Pennsylvania:																					
Berks	5,260,362	7,089,989	X	X								X	X				2				X
Montgomery			X	X								X	X				1				X
Northampton			X	X	X							X	X				2				X
Bucks			X	X			X					X	X				8		X	X	X
Lancaster			X	X						X		X	X				3		X		X
Philadelphia			X	X								X	X					1		X	
Schuylkill	105,639	319,161	X	X						X		X	X				1		X		X
Total	5,366,001	7,409,150															17	1			
Grand total	14,257,014	23,233,049															89	10			

[1] Included with "Undistributed" to avoid disclosing individual company confidential data.
[2] Includes tonnage and value for counties that must be concealed as indicated by footnote 1.

Slag (Iron-Blast Furnace).—Output of blast-furnace slag increased, despite a slump in highway construction and a steel strike, from 7,203,000 short tons in 1958 to 7,240,000 tons in 1959. The value of output also increased from $11,334,000 to $11,847,000. Pennsylvania continued to be the leading producer of blast-furnace slag, having 26 percent of the United States tonnage.

Stone.—Output of stone (including slate and oystershell) increased in tonnage and value (9 and 11 percent, respectively). The growth was due primarily to a greater demand for dimension stone for rough construction purposes and crushed or broken stone as concrete aggregate, refractory material, and for agriculture. Stone for rubble, dressed building stone, and sundry uses for dimension and crushed stone increased. The demand for riprap, flux, railroad ballast, curbing and flagging stone, and rough architectural stone was lower in 1959. Stone (sandstone, granite, basalt, limestone, oystershell, miscellaneous stone, and slate) was produced in 46 of the 67 counties in Pennsylvania. New operations were reported in Clarion and Tioga Counties. Northampton County was the leading producing county. Counties producing over 2 million tons, in decreasing order, were: Northampton, Montgomery, York, Berks, Lawrence, Lancaster, Chester, Lehigh, and Centre. In addition, Adams, Bucks, Delaware, and Lebanon Counties each produced over 1 million tons.

Output of limestone, the leading stone produced, increased 8 percent in tonnage and 11 percent in value. This increase was due primarily to a 10-percent increase in the demand for limestone as concrete aggregate, agricultural stone, and dimension stone for building purposes. Significant decreases were reported in the use of limestone as flux and railroad ballast. Crushed limestone was produced in 35 counties—1 more than in 1958 (Clarion). Northampton County continued to be the leading county in output, with 5.8 million tons, followed in decreasing order by counties producing over 2 million tons—Montour, York, Lawrence, Lancaster, Berks, Lehigh, Centre, and Chester. Dimension limestone continued to be produced in Bucks and Lancaster Counties; most of the production came from Bucks County.

Sandstone, the third ranking stone in Pennsylvania, was marketed as both dimension and crushed stone. Output was greater than in 1958 with increases of 21 percent in tonnage and 13 percent in value. The greater output resulted primarily from an increased demand for crushed sandstone as concrete aggregate and refractory material. Refractory use increased 48 percent in tonnage, and aggregate use increased 16 percent. Crushed sandstone also was used as riprap, railroad ballast, and for miscellaneous uses, with only the use of riprap increasing. Dimension sandstone was marketed for use as rough construction stone, rubble, rough architectural stone, sawed or dressed building stone, and curbing and flagging stone. Only the use of rough and dressed construction stone and rubble showed increases over 1958. Overall, 18 percent more dimension stone was marketed in 1959 than in 1958. Crushed sandstone was marketed from 15 counties and dimension sandstone from 10 counties. Allegheny, Chester, Delaware, Potter, and York Counties produced dimension stone only.

Dimension stone also was produced in Mercer, Montgomery, Susquehanna, Wayne, and Westmoreland Counties, with Montgomery County being a leading producer of dimension stone. The leading county for the production of crushed sandstone was Wayne, and Huntingdon was the leader in value of crushed stone. Leading counties having over 100,000 short tons of crushed sandstone in decreasing order were Wayne, Luzerne, Susquehanna, Blair, and Westmoreland Counties.

Granite was prepared and marketed only as dimension stone. Production was approximately five times that reported in 1958. The increase was due primarily to greater demand for rough and dressed construction stone. In addition to rough construction stone, granite was marketed for use as rubble, rough architectural stone, and dressed building stone. Delaware County continued to be the only source of granite in Pennsylvania.

The tonnage of miscellaneous stone produced increased 75 percent. All use categories for miscellaneous stone increased. Dimension stone was marketed as rough construction stone, rubble, and curbing and flagging stone, and crushed stone was marketed for use as concrete aggregate. Crushed miscellaneous stone continued to be produced in Bucks and Montgomery Counties. Dimension miscellaneous stone was produced in Delaware, Lycoming, Potter, and Westmoreland Counties, with most of the production coming from Delaware County.

Basalt output increased primarily because of the greater demand for its use as concrete aggregate. In addition, more of the overall production of crushed basalt was used as railroad ballast and for miscellaneous uses. Riprap was the only use for crushed basalt that declined. Demand for dimension basalt, used as rough construction stone and rubble, was lower. Basalt was used as rubble for the first time. Crushed basalt was produced in eight counties, with Delaware and Berks Counties leading. Dimension basalt was produced in Bucks, Chester, and Montgomery Counties, with Montgomery County the leading source.

Oystershell was again collected in Berks County and processed for agriculture.

Pennsylvania continued to rank first in the United States in the output of slate, despite a continued drop in production. Sales of dimension slate increased slightly over 1958, with more structural and sanitary slate, billiard table slate, and flagging slate being sold. Use of slate for roofing, blackboards, and school slates declined. The lower demand for slate as granules and flour contributed greatly to the decline of the slate industry in 1959.

Dimension slate was produced in Lehigh and Northampton Counties by 12 companies. Most of the dimension stone came from 11 operations in Northampton County. Crushed slate was marketed from operations in Northampton and York Counties; a major portion of production came from one operation near Delta in York County. The three producers of crushed slate in Northampton County also produced dimension slate.

TABLE 11.—Stone sold or used by producers, by uses

Use	1958		1959	
	Short tons	Value	Short tons	Value
Dimension stone:				
Building stone	160,067	$1,218,119	176,989	$1,344,896
Curbing and flagging	(1)	(1)	12,118	289,281
Other uses	49,419	3,303,682	50,134	3,320,679
Total	209,486	4,521,801	239,241	4,954,856
Crushed and broken stone:				
Riprap	27,441	23,645	10,032	11,657
Concrete and road metal	18,537,260	28,025,216	20,443,307	31,491,790
Furnace flux (limestone)	5,443,191	9,806,835	5,076,505	9,393,129
Railroad ballast	749,066	1,181,230	736,546	1,196,019
Agricultural	776,764	2,497,005	888,123	2,518,380
Other uses [2]	14,305,954	23,637,826	16,287,967	27,854,836
Total	39,839,676	65,171,757	43,442,480	72,465,811
Grand total	40,049,162	69,693,558	43,681,721	77,420,667

[1] Included with "building stone."
[2] Includes "refractory."

TABLE 12.—Stone sold or used, by counties

County	1958		1959	
	Short tons	Value	Short tons	Value
Adams, Cumberland, Franklin	(1)	(1)	2,906,992	$6,260,476
Berks	2,421,954	$2,871,294	2,911,256	3,922,354
Blair, Huntingdon	1,292,864	3,544,709	1,153,003	3,110,245
Bucks	723,545	1,378,818	1,714,805	2,962,656
Butler	911,054	1,721,255	877,883	1,757,108
Carbon, Monroe, Schuylkill	397,445	1,854,012	431,930	1,814,413
Centre	1,786,483	3,328,604	2,120,484	4,275,778
Chester	(1)	(1)	2,506,541	5,347,571
Dauphin, Lehanon, Perry	3,097,531	5,219,468	(1)	(1)
Delaware, Chester	3,486,163	6,634,978	(1)	(1)
Fayette, Somerset	574,051	1,094,813	633,560	1,336,633
Franklin	595,540	971,805	(1)	(1)
Juniata, Mifflin, Snyder	805,623	1,292,431	(1)	(1)
Lancaster	1,872,585	3,047,407	2,508,298	3,763,864
Lawrence	3,102,531	5,361,898	2,884,686	5,155,072
Lehanon	(1)	(1)	1,853,672	3,126,445
Lehigh, Northampton	7,538,588	10,368,901	8,047,822	11,152,655
Luzerne	(1)	(1)	211,109	345,458
Mercer	11,808	39,944	13,235	49,690
Montgomery	3,644,264	6,151,576	3,661,015	6,326,769
Northumberland	58,700	100,950	53,400	94,280
Snyder	(1)	(1)	77,999	135,935
Susquehanna, Luzerne, Wyoming	354,671	717,095	(1)	(1)
Tioga			115	2,800
Union	212,950	356,300	282,028	464,487
Wayne	115,343	246,471	(1)	(1)
Westmoreland	520,904	961,715	567,190	1,068,130
Undistributed [2]	6,524,565	12,429,114	8,264,698	14,947,848
Total	40,049,162	69,693,558	43,681,721	77,420,667

[1] Figure withheld to avoid disclosing individual company confidential data.
[2] Includes tonnage and value for counties as indicated by footnote 1 and the following counties: Allegheny, Armstrong, Bedford, Clarion (1959), Clinton, Fulton, Lycoming, Montour, Potter, and York.

Sulfur.—Byproduct sulfur continued to be recovered in the liquid purification of natural gas obtained from domestic and foreign deposits. The Sinclair Refining Co. Marcus Hook refinery used the

Claus process to produce liquid sulfur and hydrogen sulfide. Gulf Oil Corp. also used the Claus process to recover byproduct sulfur at its Philadelphia refinery. The Atlantic Refining Co. (Philadelphia) recovered hydrogen sulfide by the Girdler process for the production of sulfuric acid for use at the local plant. Sulfur also was recovered at the Sun Oil Co. Marcus Hook refinery, using a two-stage catalytic oxidation of hydrogen sulfide.

Talc.—Output of pyrophyllite (serecite schist) and soapstone increased, due mainly to a growth in demand for these materials as a filler in asphaltic compounds, insecticides, and roofing materials. The serecite schist was processed at Aspers, and the soapstone was transported to Marriottsville (Carroll County, Md.) for processing.

Tripoli.—Greater demand for filler material contributed to increased production of tripoli. In addition to filler, tripoli was used as a buffing compound.

Vermiculite (Exfoliated).—Crude vermiculite from Western States and foreign countries continued to be exfoliated at plants in Bucks and Lawrence Counties. Operations in Clearfield County were discontinued in the latter part of 1958. The exfoliated vermiculite was used for sundry uses, including insulating refractories and construction insulation.

METALS

Cadmium.—Cadmium continued to be recovered from zinc dust at the St. Joseph Lead Co. Josephtown plant and the New Jersey Zinc Co. Palmerton smelter.

Ferroalloys.—Production of ferroalloys decreased to 376,905 short tons from 412,300 tons in 1958. Shipments consisted of ferromanganese, spiegeleisen, ferromolybdenum, ferrotungsten, ferrocolumbium, ferroboron, aluminum-vanadium, molybdenum-aluminum, nickel-tungsten, and nickel-columbium.

Iron Ore.—Shipments of usable iron ore from mines in Pennsylvania increased despite a 116-day steel strike. All ore (magnetite) produced at the Cornwall and Grace underground mines was shipped to the Lebanon and Morgantown concentrators for processing, respectively. Concentrate from the Lebanon concentrator and a small quantity of concentrate from the Morgantown concentrator were processed at a local agglomerating plant. Shipments from the Lebanon plant consisted of concentrate and agglomerates (sinter and pellets) for use in producing pig iron and steel. Shipments from the Morgantown concentrator consisted primarily of concentrate for direct use in producing pig iron and steel. Copper, cobalt, and pyrites also were recovered from the ores.

Iron and Steel Scrap.—Ferrous scrap was collected and prepared primarily in Pittsburgh, Glassport, Harrisburg, Dunmore, Kittanning, Greensburg, Sharpsburg, and Conshohocken. Active plants varied monthly from 75 to 86. The leading varieties of scrap processed and shipped were Nos. 1 and 2 heavy-melting steel and No. 2 and all other bundles.

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TABLE 13.—Shipments of ferrous scrap by dealers, brokers, and automobile wreckers in 1959, by grades in short tons

Grades of scrap	Shipments from yard		Direct shipments, other than from yard operations	
	To domestic consumers	For export	To domestic consumers	For export
No. 1 Heavy Melting steel	186,918	19,140	10,021	3,630
No. 2 Heavy Melting steel	65,113	12,588	1,697	4,216
No. 1 and electric furnace bundles	(1)	(1)	22,530	
No. 2 and all other bundles	91,628	8,773	29,627	2,019
Low-phosphorus scrap	32,033	643	11,549	
Cast-iron scrap other than borings	58,686	236	3,273	
Turnings and/or borings, alloy free	(1)	(1)	4,582	
Rerolling rails	326		644	
Scrap rails	4,169	20	852	
Stainless steel	5,890		1,169	
All other alloy iron and steel	1,199		1,176	
Undistributed [2]	163,596	1,328	34,739	
Total	609,558	42,728	121,859	9,865

[1] Figure withheld to avoid disclosing individual company confidential data.
[2] Includes tons of high-speed steel scrap, all other prepared scrap, unprepared scrap, and items indicated by footnote 1.

Molybdenum.—Climax Molybdenum Co. operated its plant at Langeloth, Washington County to produce ferromolybdenum and molybdic oxide from molybdenum concentrate originating at the company mine and mill in Climax, Colo.

Pig Iron.—Despite the 116-day steel strike pig iron production totaled 15.1 million net tons, a 4-percent increase over 1958. The pig iron was produced by 14 companies operating 23 plants having 78 stacks. The classes of pig iron produced in 1959 were basic, Bessemer, foundry, low-phosphorus, malleable, and direct casting. More basic and Bessemer pig iron were produced than other classes, totaling 13.2 million short tons of basic (8-percent increase) and 972,000 tons of Bessemer, (40-percent decrease). In blast furnaces, raw-material consumption totaled 9.7 million tons of domestic iron ore, 4.1 million tons of foreign iron ore, 740,800 tons of mill cinder and roll scale, 21,700 tons of flue dust, 1.3 million tons of open-hearth and Bessemer slag, 11.9 million tons of coke, 4.2 million tons of limestone and dolomite, 71,000 tons of pig iron and hot metal, 807,900 tons of home and purchased scrap, 187,600 tons of slag scrap, 7.8 million tons of sinter, and 670,000 tons of pellets. In addition, manganiferous ore, coke breeze, anthracite, self-fluxing agglomerates, nodules, briquettes, and foreign agglomerates were consumed in making pig iron. A total of 3.6 million short tons of domestic iron ore, 233,900 tons of mill cinder and roll scale, 1.3 million tons of flue dust, 234,800 tons of anthracite, and some foreign iron ore, manganiferous ore, and limestone and dolomite and coke breeze were consumed in agglomerating plants in Pennsylvania to produce sinter and self-fluxing agglomerates.

TABLE 14.—Consumption of pig iron and ferrous scrap by type of furnace, in short tons

Type of furnace and raw material	1958	1959	Type of furnace and raw material	1958	1959
Open-hearth furnaces:			Air furnaces:		
Pig iron	12,352,563	13,301,590	Pig iron	35,195	47,064
Scrap	8,142,654	9,960,128	Scrap	109,366	148,385
Total	20,495,217	23,261,718	Total	144,561	195,449
			Blast furnaces: Scrap	1,020,784	1,027,609
Bessemer converters: [1]					
Pig iron	792,223	752,653	Miscellaneous uses:		
Scrap	248,801	275,731	Pig iron (Direct casting)	944,801	1,116,514
Total	1,041,024	1,028,384	Scrap [3]	87,196	86,648
			Total	1,031,997	1,203,162
Electric steel furnaces: [2]					
Pig iron	22,311	27,047	Total Pennsylvania:		
Scrap	1,388,008	1,774,097	Pig iron	14,355,285	15,489,188
Total	1,410,319	1,801,144	Scrap	11,489,204	13,866,340
			Total	25,844,489	29,355,528
Cupola furnaces:					
Pig iron	208,192	244,320			
Scrap	492,395	593,742			
Total	700,587	838,062			

[1] Includes scrap and pig iron consumed in basic oxygen steel process.
[2] Includes small quantity of scrap and pig iron used in crucible furnaces.
[3] Miscellaneous includes rerolling, reforging, and ferroalloy.

Zinc.—Production of zinc concentrate increased over 50 percent in 1959. The ore produced at the Friedensville mine was concentrated at a nearby plant, and the concentrate was shipped to the Palmerton smelter for processing.

Smelters.—The Palmerton and Josephtown smelters were active in 1959. The Palmerton plant of New Jersey Zinc Co. processed crude ore or concentrate from company operations at Friedensville, Pa.; Austinville, Va.; Jefferson City and Treadway, Tenn.; Canyon City, Colo.; and other domestic and foreign sources. Both zinc and lead were produced. The Josephtown smelter of the St. Joseph Lead Co. processed zinc concentrate received from the company's Edwards and Balmat, N.Y., and Indian Creek, Mo. operations, as well as materials from other States and foreign countries. Plant improvements at the St. Joseph Lead plant centered on the construction of a special high-grade zinc column and development of a continuous-flow technique of casting high-purity zinc into 2,500 pound ingots. Construction of a new roasting and acid plant was completed at Palmerton. In addition, a more efficient, electrically operated system of removing residue from slab zinc furnaces was installed.

REVIEW BY COUNTIES

Adams.—Two companies operated limestone quarries near Gettysburg and Fairfield, producing crushed stone for use as concrete aggregate and roadstone. Bethlehem Limestone Co. quarried and crushed limestone at the quarry and plant west of Hanover, chiefly for blast-furnace flux, concrete aggregate, and stone sand. Quantities of roadstone were sold under contract to nearby Government agencies. The Funkhouser Mills, Division of The Ruberoid Co., continued to oper-

ate the Carmian quarry, east of Charmian in Adams County, to produce crushed and ground stone for use as roofing granules and stone flour.

Liberty Stone Co. produced soapstone at a pit near Fairfield and transferred the crude material to its Marriottsville, Md., plant for processing. Summit Mining Corp. recovered sericite schist at the Heller No. 3 mine, 3 miles west of Bendersville. The crude material was trucked to the company plant at Aspers to be crushed, screened, and ground primarily for use as a filler in asphaltic compounds and joint cements and for use in insecticides.

TABLE 15.—Value of mineral production in Pennsylvania [1 2 3]

County	1958	1959	Minerals produced in 1959 in order of value
Adams	(4)	(4)	Stone, sericite schist, clays.
Allegheny	$45,620,873	$43,462,995	Cement, coal, clays, sand and gravel, iron ore (pigment material), stone.
Armstrong	(4)	(4)	Coal, sand and gravel, clays, lime, stone.
Beaver	(4)	(4)	Clays, coal, sand and gravel.
Bedford	1,620,266	(4)	Coal, stone, lime, sand and gravel.
Berks	9,411,867	13,690,800	Cement, iron ore, stone, clays, sand and gravel, gem stone.
Blair	1,982,391	2,218,760	Stone, coal, clays, sand and gravel.
Bradford	(4)	87,881	Sand and gravel, coal.
Bucks	(4)	(4)	Sand and gravel, stone, clays, gem stone.
Butler	13,648,257	14,803,739	Coal, cement, lime, stone, sand and gravel, clays.
Cambria	53,453,928	42,242,812	Coal, clays, sand and gravel, iron ore (pigment material).
Cameron	(4)	171,706	Coal.
Carbon	(4)	(4)	Coal, stone, sand and gravel.
Centre	(4)	(4)	Lime, coal, stone, clays.
Chester	5,664,017	(4)	Stone, lime, clays, graphite, gem stone.
Clarion	10,658,426	(4)	Coal, stone, clays.
Clearfield	(4)	26,836,053	Coal, clays, sand and gravel.
Clinton	2,530,185	2,708,633	Coal, stone, clays, sand and gravel.
Columbia	(4)	(4)	Coal, sand and gravel, clays.
Crawford	154,417	179,678	Sand and gravel.
Cumberland	(4)	(4)	Stone, sand and gravel, clays.
Dauphin	3,645,000	3,317,375	Stone, coal, clays, sand and gravel, lime.
Delaware	(4)	2,608,524	Stone.
Elk	1,654,417	1,370,674	Coal, clays, sand and gravel.
Erie	(4)	(4)	Sand and gravel, peat.
Fayette	19,646,651	(4)	Coal, stone, clays, sand and gravel.
Forest	(4)	(4)	Sand and gravel.
Franklin	1,183,313	(4)	Stone, sand and gravel, lime.
Fulton	(4)	(4)	Do.
Greene	62,201,305	61,165,085	Coal.
Huntingdon	5,065,357	4,931,074	Sand and gravel, stone, coal, clays.
Indiana	(4)	(4)	Coal, clays.
Jefferson	(4)	(4)	Do.
Juniata	(4)	(4)	Stone, lime.
Lackawanna	19,938,059	19,614,830	Coal.
Lancaster	(4)	(4)	Stone, coal, sand and gravel, lime, clays, gem stones.
Lawrence	(4)	(4)	Cement, stone, coal, clays, sand and gravel, peat.
Lebanon	18,967,978	16,449,766	Iron ore, lime, stone, copper, cobalt, gold, pyrite, silver, coal.
Lehigh	(4)	(4)	Cement, zinc, stone, gem stone.
Luzerne	68,949,149	(4)	Coal, sand and gravel, stone, peat, clays.
Lycoming	1,555,434	1,806,045	Stone, sand and gravel, coal, tripoli.
McKean	455,381	436,981	Clays, coal, sand and gravel.
Mercer	3,101,323	2,585,092	Coal, sand and gravel, stone.
Mifflin	(4)	(4)	Sand and gravel, stone, lime.
Monroe	(4)	(4)	Stone, sand and gravel, gem stone.
Montgomery	12,620,278	13,964,287	Cement, stone, lime, clays, sand and gravel, gem stone.
Montour	(4)	(4)	Stone.
Northampton	(4)	(4)	Cement, stone, sand and gravel, coal, gem stone.
Northumberland	(4)	(4)	Coal, clays, stone, sand and gravel, lime.
Perry	(4)	(4)	Stone.
Philadelphia	399,767	485,638	Sand and gravel, gem stone.
Potter	(4)	(4)	Stone.
Schuylkill	(4)	65,530,404	Coal, stone, sand and gravel, clays.
Snyder	477,614	548,014	Coal, clays, stone, lime.
Somerset	(4)	(4)	Coal, clays, stone, sand and gravel.

See footnotes at end of table.

TABLE 15.—Value of mineral production in Pennsylvania[1 2 3]—Continued

County	1958	1959	Minerals produced in 1959 in order of value
Sullivan	$88,755	$81,311	Coal.
Susquehanna	(4)	(4)	Stone, sand and gravel.
Tioga	1,465,869	1,217,688	Coal, stone.
Union	356,300	464,487	Stone.
Venango	(4)	2,616,378	Coal, sand and gravel.
Warren	(4)	(4)	Sand and gravel.
Washington	69,836,603	64,510,269	Coal, clays.
Wayne	(4)	(4)	Stone, sand and gravel, peat, coal.
Westmoreland	21,052,979	19,643,023	Coal, stone.
Wyoming	(4)	(4)	Sand and gravel, stone.
York	14,902,598	15,875,371	Cement, stone, lime, sand and gravel, clays, mica.
Undistributed	[5] 409,731,227	418,192,816	
Total	[5] 882,040,000	863,818,000	

[1] Pike County is not listed because no production was reported.
[2] Excludes value of production for LP-gases, natural gasoline, petroleum, and some gem stone unspecified by counties, but value is included with "Undistributed."
[3] Excludes values of clays and stone used in manufacturing lime and cement.
[4] Figure withheld to avoid disclosing individual company confidential data.
[5] Revised figure.

Gettysburg Drain Tile Works (Gettysburg) and Alwine Brick Co. (New Oxford) mined miscellaneous clay from open pits and used the clay for making draintile and building brick, respectively.

Allegheny.—Shipments of cement from Allegheny County declined. Universal Atlas Cement, Division of U.S. Steel Corp., manufactured portland and masonry cements using the dry process. Two 360- x 10-foot rotary kilns were operated at the company plant at Universal. Pittsburgh Coke & Chemical Co., Green Bag Cement Division, at its Neville Island plant, produced chiefly by the wet process portland-pozzolan cement and some waterproof-portland and masonry cements. Major shipments were by truck to points in Pennsylvania, Ohio, and West Virginia.

Bituminous coal was produced from underground and strip mines, with underground tonnage comprising 88 percent of the production. Twenty-nine underground mines were active—3 less than in 1958. A total of 92 cutting machines cut 4.2 million tons of coal; 4.1 million tons of coal was mechanically loaded, and 3.2 million tons was mechanically cleaned. Of the mechanically cleaned coal, 90 percent was wetwashed, with jigs accounting for 33 percent. Twenty-seven strip mines, 2 more than in 1958, produced coal, using 38 power shovels and 8 draglines. Most of the draglines and shovels had less than 3-cubic-yards capacity.

Allegheny County ranked second in the State as a miscellaneous-clay-producing area. Seven clay producers operated open pits near Creighton (2), McKeesport, Bridgeville, Pitcairn, Wilkinsburg, and Pittsburgh. The miscellaneous clay was used principally for making building brick. Milliken Brick Co., Inc., (Wilkinsburg) was the leading clay producer in the county.

The combined output of McCrady, Inc., and Sidwell Loam Sand Co. halted the steady decline of the sand and gravel industry in the area for the first time since 1954. Sand and gravel was processed for foundry and building uses and fill.

Pennsalt Chemicals Corps, produced and marketed crude red iron oxide pigments from dump piles near Natrona.

Nick Gioia, Elizabeth Township, produced dimension sandstone as rubble. Malli Mines produced dimension sandstone as irregular-shaped building stone from a quarry in Jefferson Borough.

Panacalite Perlite Co. (Pittsburgh) and Perlite Manufacturing Co. (Carnegie) expanded perlite from crude material obtained from Nevada and New Mexico. The material was sold or used mainly for use in building plaster.

Armstrong.—Fifty-eight bituminous coal underground mines, 36 strip mines, and 9 auger mines were active in 1959. This represented an increase of two underground and three auger mines and a decrease of one strip mine. Slightly more coal was produced from strip mines than from underground mines. Forty-seven power shovels and 19 draglines were operated; 45 of the power shovels had less than 3-yards capacity; 4 draglines had 3-yards capacity; and 11 had between 3- and 5-yards capacity. Eighty-nine cutting machines mechanically cut 1.2 million tons of coal. Eighty-five percent of the underground production was mechanically loaded, and 39 percent was mechanically cleaned. Pneumatic and other wetwashing methods were used for cleaning the coal.

J. K. Davison & Bros., Glacial Sand & Gravel Co., and Manorville Sand Co. processed sand and gravel for commercial and local and State government consumption. Armstrong County continued as the second-ranking sand and gravel producing area and the center of the industry in southwestern Pennsylvania.

Production and value of clay increased 7 percent compared with 1958, and the county ranked fourth in tonnage and second in total value. Fire clay was sold or used mainly for making firebrick and block and building brick. Six underground mines were operated in the county near Kittanning (2), Freeport, Templeton, Adrian, and New Bethlehem, and two open-pits were operated near Craigsville and Worthington. The Bridgeport underground operation of Haws Refractories Co., near Kittanning, was idle.

Hydrated lime sold for agricultural purposes was burned by three producers (all near Kittanning).

Two producers, both near Kittanning, quarried and crushed limestone solely for use in making lime.

Beaver.—Beaver County ranked second in tonnage of clay produced and third in value, with both showing a slight increase. Chief uses for fire clay sold or used were for making heavy clay products (building brick), floor and wall tile, and firebrick and block, and in foundries and steelworks. Some miscellaneous clay was used in manufacturing building bricks, art pottery, and flowerpots. Four underground and seven open-pit mines were operated; three near Darlington, two each near New Brighton and Fallston, and one each near Beaver Falls, Vanport, New Galilee, and Negley.

Ninety-three percent of the bituminous coal production came from 24 strip mines. The remainder was obtained from four underground mines. Twenty-six power shovels, 8 draglines, 16 bulldozers, 3 horizontal power drills, and 2 vertical power drills were used at the

stripping operations. At the underground mines, four cutting machines and two loading machines were used, with 40 percent of the county production being mechanically loaded. None of the underground production was mechanically cleaned.

Shippingport Sand & Gravel Co. (Shippingport) and Lee Block Co. (Industry) prepared sand and gravel for building and paving use.

Bedford.—Sixty-two percent of the bituminous coal production came from 24 underground mines. Of the underground production, 39 percent was mechanically loaded, and none was mechanically cleaned. At the four strip mines, six power shovels, three draglines, six bulldozers, and two horizontal power drills were used.

J. Mason Kerr (Hyndman) produced crushed limestone for use in making lime. New Enterprise Stone & Lime Co. (Everett) crushed limestone at its Ashcom plant, principally for concrete aggregate, asphalt fill, dust for coal mines, and agricultural uses. Leap Ganister Rock Co. produced ganister rock at its No. 1 quarry near Madley. The stone was crushed and sized at a local plant for use as furnace or converted linings and in making ferrosilicon.

J. Mason Kerr produced and sold quicklime for agricultural purposes, using one pot kiln at its plant near Hyndman. New Enterprise Stone & Lime Co. produced and sold hydrated lime for agricultural purposes at its Ashcom plant near Everett.

Feight Bros. (Everett) produced sand and washed it at a local preparation plant for use as building material.

Berks.—Shipments and value of portland cement increased 4 and 9 percent, respectively. Allentown Portland Cement Co. produced portland and masonry cements at its No. 1 five-kiln plant (Evansville). Major shipments to ready-mixed concrete companies were mostly in bulk by railroad to locations in Pennsylvania, New York, New Jersey, and Connecticut. Smaller quantities were shipped to other eastern States.

Bethlehem Cornwall Corp., a subsidiary of Bethlehem Steel Co., continued operating its Grace underground mine, producing crude iron ore, 90 percent by block caving, 5 percent by open stope, and 5 percent by shrinkage stoping. The crude ore was processed at the local company concentrator by flotation and magnetic concentration.

Production and value of stone increased 20 and 39 percent, respectively. Four companies quarried and crushed limestone at six operations in the county—two near Evansville and one each near Temple, Sinking Spring, Kutztown, and Oley. The stone was used chiefly for concrete aggregate, cement, and asphalt filler. Eighty-four percent of the stone produced was shipped by truck. Oystershell was crushed for use as poultry grit and mineral food. Basalt, produced by the John T. Dyer Quarry Co. at the Clingan quarry (Birdsboro), was crushed and sized at a local plant for railroad ballast and roadstone.

Glen-Gery Shale Brick Corp. (Wyomissing and Shoemakersville) produced miscellaneous clay for use in manufacturing building brick from open-pit operations.

John H. Gring (Sinking Spring) produced building sand and gravel and paving gravel for use by local builders. Building sand and gravel was produced by Schildt Bros. (Temple).

Gem-quality travertine, heulandite, and diopside were collected near Temple, Gibralter, and Quakertown. Some of the stones were for collectors items and for making novelty jewelry.

Blair.—Crushed limestone was produced by six companies operating seven quarries near Hollidaysburg, Altoona, Claysburg, Canoe Creek, and Roaring Spring. Output was used chiefly for concrete aggregate, roadstone, and agricultural purposes. The leading producer was New Enterprise Stone & Lime Co. General Refractories Co., Claysburg quarry (Claysburg) and J. L. Hartman, Sara Furnace quarry (Sproul), mined and crushed quartzite for use in making silica brick. Basalt Trap Rock Co., Williamsburg, quarried and crushed quartzite for use as railroad ballast, road material, and riprap.

Bituminous coal was produced from two underground mines and two strip mines, compared with three underground mines, three strip mines in 1958. No production came from auger mines as did in 1958.

The output of clay (kaolin, fire clay, and miscellaneous clay) continued to decline. Kaolin was recovered from the No. 1 open pit near Williamsburg and sold for use in making firebrick and block. Woodbury Clay Co., Williamsburg, produced and sold plastic fire clay for use in manufacturing foundry refractories. Blair Clay Products, Inc., east of Ashville, produced miscellaneous clay for manufacturing building brick.

General Refractories Co. (Frankstown) produced gravel for building use. Frankstown Sand Co. (near Hollidaysburg) produced building sand.

The Chimney Rocks Lime & Stone Co. (Hollidaysburg) did not operate its lime plant.

Bradford.—All sand and gravel produced for paving use by Towanda Sand & Gravel Co., Inc., was purchased by the Pennsylvania Department of Highways.

Bituminous coal was produced solely from one strip mine. The mine used one power shovel and one bulldozer.

Bucks.—The first increase in sand and gravel output since 1956 was reported; this strengthened the position of Bucks County as the leading county in sand and gravel production. Four of the eight companies producing sand and gravel met the increased demand. Shipments of sand and gravel by waterway again exceeded the combined tonnage transported by rail and truck. Material processed was used primarily for building and paving uses.

Four limestone quarries were operated near Rushland, Buckingham, New Hope, Eureka, and Langhorne and yielded limestone crushed chiefly for use as concrete aggregate. Edward Karpinski (Langhorne) produced dimension limestone for use as rough construction. Coopersburg Granite Co. produced dimension basalt at its quarry east of Coopersburg in Bucks County for dressed architectural and monumental stones and rubble. Edison Quarry, Edison,

quarried dimension basalt as rough and dressed construction stone. Four operators near Edison, Ottsville, Telford, and Quakertown quarried and crushed basalt chiefly for concrete and roadstone and also for use as railroad ballast and for filter beds in sewage plants. Samuel M. Yoder Estate operated the Blooming Glen Crushing Works and quarry at Blooming Glen (redstone and bluestone), and George Wiley operated Wiley's quarry (bluestone) near Point Pleasant. Both companies quarried and crushed sandstone for road material. Better Materials Corp., Rushland, quarried miscellaneous stone (argillite), crushed it at its local plant, and marketed it for use as concrete aggregate and roadstone.

Miscellaneous clay used for the manufacture of building brick was recovered by Quakertown Brick & Tile Co. (Quakertown).

Greenockite, a semiprecious stone, was collected by a hobbyist.

Vermiculite, imported from the Union of South Africa by Hyzer & Lewellen, was processed at the company's Southampton plant. The material was sold or used primarily for residential and refractory insulation products.

Butler.—Bituminous coal was produced from 28 underground mines, 38 strip mines, and 3 auger mines, 3 additional underground mines and 1 more auger mine than in 1958. Forty-two cutting machines and 14 loading machines were used in the underground mines, 42 percent of the production was mechanically loaded. Fifty-five power shovels, 37 draglines, 1 carryall, and 47 bulldozers were used at the strip mines. Only 26 percent of the coal was mechanically cleaned, all by jigs.

Penn-Dixie Cement Corp. used captive crushed limestone for manufacturing Types I–II–III portland and mortar cements by the wet process at its No. 9 West Winfield plant. Two 250- x 10.6-foot rotary kilns were operated. The major output of cement was shipped by truck, in bulk, mostly to ready-mixed concrete companies. The material was sent mainly to points in Pennsylvania, West Virginia, and Ohio.

Mercer Lime & Stone Co. produced quicklime and hydrated lime at its plant one-half mile west of Branchton. Quicklime and hydrated lime was marketed for chemical and industrial uses, and some hydrated lime was sold for agricultural purposes.

Output of limestone was from four quarries, two near West Winfield and one each near Harrisville and Branchton. The crushed limestone was chiefly for concrete aggregate, roadstone, cement manufacture, and agricultural purposes. Forty-eight percent of the stone was transported by truck. The remainder was shipped by unspecified conveyances or consumed at the local plants.

Sand and gravel for building needs was supplied by H. W. Cooper and Highway Sand & Gravel Co., Inc., both operating stationary plants near Slippery Rock.

Glenn R. Boosel (West Sunbury) produced flint fire clay for making refractory mortar. Scott Borland Brick Yard (Mars) recovered shale to make building brick at the company plant. McCrady Re-

fractories, Inc. (Slippery Rock) recovered and sold plastic fire clay for the manufacture of refractories for foundries and steelworks.

Cambria.—Ninety-two underground mines, 27 strip mines, and 1 auger mine were worked in 1959 for bituminous coal. Ninety-three percent of the production came from the underground mines, 6 percent from strip mines, and the remainder from the auger mine. Two hundred and five cutting machines and 243 loading machines were used in the underground operations; 96 percent of the underground production was mechanically loaded. Fifty power shovels, 16 draglines, 36 bulldozers, 10 horizontal power drills, and 4 vertical power drills were used at the strip mines. Approximately 69 percent of the coal production was mechanically cleaned. A little over half of the coal was mechanically cleaned using pneumatic methods.

Fire clay used for making heavy clay products was mined from pits near Patton and South Fork, and miscellaneous clay for use in making building brick was mined near Johnstown.

Nicosia Stone Quarry produced sand for building brick and other building uses.

Lanzendorfer Minerals Co. produced and sold iron oxide pigments of the sulfur mud variety from its No. 31 mine near Nanty Glo for use in making paint pigments.

Cameron.—The entire production of bituminous coal came from one strip mine. Three power shovels, one dragline, and three bulldozers were used at this mine.

Carbon.—Production and value of anthracite increased considerably (40 and 49 percent, respectively). Leading producers were: Coaldale Mining Co., Inc.; Valley Stripping Corp.; and Pollock Trucking Co. Anthracite was mined from underground mines, strip pits, and culm banks.

North American Refractories produced quartzite at the Little Gap mine and crushed the stone at its Palmerton plant for use in making silica brick.

Alliance Sand Co., Inc., operated its pit and fixed plant near Palmerton, producing prepared sand for paving, cement manufacture, and other building uses. Other operating sand and gravel plants were Wagner Sand Co. (near Hazleton), producing both sand and gravel for building use, and Butz Lumber Co. (Palmerton), preparing only building sand.

Centre.—Output and value of hydrated lime and quicklime increased 30 and 29 percent, respectively, and Centre County again ranked as the leading lime-producing area. Three producers each operated three rotary limekilns near Bellefonte. Quicklime and hydrated lime were sold chiefly for industrial and chemical uses, with smaller quantities for building and agricultural uses.

One auger mine, 17 bituminous coal underground mines, and 18 strip mines were active. Ninety-two percent of the county's production came from the strip mines where 35 power shovels, 11 draglines, and 31 bulldozers were used. At underground operations, seven cutting machines and one loading machine were used, with 25 percent of the underground production loaded mechanically. Pneu-

matic methods were used to clean a small quantity of the bituminous coal produced.

Limestone, the only stone produced in the county, increased 19 and 28 percent in tonnage and value, respectively. The principal uses of the limestone were for concrete aggregate, lime manufacture, open-hearth flux, glass making, and stone sand. Six companies reported output of crushed and broken limestone, principally from quarries near Bellefonte, State College, and Pleasant Gap.

Harbison-Walker Refractories Co. mined fire clay at the Blair clay pit.

Chester.—The leading limestone producer in the county, Bradford Hills Quarry, Inc., operated a quarry and crushing plant near Downingtown, producing crushed and broken limestone as road material. The company also sold stone for road construction to local government agencies. The Cedar Hollow quarry and plant at Devault, operated by Warner Co., Bellefonte Division, yielded limestone crushed for use as road material and blast-furnace flux at chemical plants, in the manufacture of refractories and lime, and for agricultural purposes. Quicklime and hydrated lime were produced chiefly for sewage and trade-waste treatment and agricultural use. Hydrated lime was sold for building lime. The company's Johnson quarry and plant near Paoli yielded limestone solely for use as concrete aggregate and roadstone. Valley Forge Stone Co. produced crushed limestone at its quarry and plant near Malvern, chiefly for use as road material. Some crushed limestone was used for blast-furnace flux.

French Creek Granite Co.'s basalt quarry near Saint Peters yielded dimension stone (black diabase) for use as rough and dressed architectural stone and ornamental stone for monuments and mausoleums. Three producers quarried and crushed basalt near Devault, Glenmoore, and Saint Peters chiefly for concrete aggregate, roadstone, railroad ballast, and riprap. Most of the stone was sold to local and nearby government agencies for road construction. Abram T. Minor, Avon-Grove quarry (Avondale); and Albert Rotunno, Rotunno quarry (West Grove) produced dimension sandstone (bluestone). The stone was sold or used as irregular-shaped building stone, rubble, and flagging stone. Bacton Hill Quarry (Malvern) and John Fecondo & Sons (Avondale) quarried dimension sandstone as irregular-shaped construction stone and rubble. The stone from the Bacton Hill Quarry was used on the exterior of the George Washington Motor Lodge (King of Prussia) and the Lower Merion Township School (Gladwyne), both in Montgomery County.

Clay tonnage and value each increased 11 percent. Miscellaneous clay was mined near Phoenixville by McAvoy Vitrified Brick Co. and used at the company plant for making building brick.

Graphite Corp. of America began producing crucible flake and fine flake at Chester Springs.

Semiprecious gem specimens (mostly kyanite, quartz, pyromorphite, and iron and lead minerals) were collected near Cornog, Chester Springs, French Creek, Saint Peters, and Phoenixville.

Clarion.—Clarion County again ranked second in the State in strip mining of bituminous coal, with 14 percent of the State's strip-mine tonnage. Seventy-eight power shovels, 35 draglines, and 60 bulldozers were used at the 31 (2 more than in 1958) active strip mines. Smaller quantities were produced by 12 underground mines and 1 auger mine. Sixty-six percent of the coal produced was mechanically loaded. Forty percent was mechanically cleaned, 38 percent by jigs and 62 percent by other wet methods.

Limestone for use as concrete aggregate, roadstone, for agricultural purposes, and stone sand was produced by Allegheny Mineral Corp. at a quarry and plant east of Parker.

Clay production increased 25 percent in tonnage but dropped 10 percent in value. Six companies operated four underground mines and two open pits. Fire clay was sold or used for manufacturing heavy clay products and firebrick and block. Miscellaneous clay was used for making building brick and structural tile. Clay producing areas were: New Bethlehem, Lucinda, Clarion, and West of Corsica in Clarion County.

Clearfield.—Clearfield County dropped from the leading producer of bituminous coal to the second-ranking county. However, the county led in production of bituminous coal from strip mines. One hundred and six strip mines were active, three less than in 1958. Production from strip mines totaled 4.8 million tons. Two hundred and twenty-three power shovels, 97 draglines, 5 carryalls, 201 bulldozers, 32 horizontal power drills, and 39 vertical power drills were used for strip operations. One less underground mine was operated in 1959, with production of underground mines totaling 1.1 million tons. Of the coal mined underground, 1 million tons was by 126 cutting machines and 687,000 tons was mechanically loaded. A total of 711,000 tons of coal was wet-washed, and 530,000 tons was cleaned using pneumatic methods.

Production of clay increased 18 percent and, although the value declined 18 percent, Clearfield remained the leading clay-producing county in the State. Twelve companies operated 28 clay operations, both underground mines and open pits, near Bigler, Curwensville, Clearfield, Wallaceton, Osceola Mills, and Boardman, and in Boggs and Woodward Townships. Most of the clay produced was plastic fire clay, sold or used for manufacturing firebrick and block, building brick, vitrified sewer pipe, and refractories. Some flint fire clay was sold and used for making firebrick and block, and miscellaneous clay was used for making building brick.

Sand and gravel was produced from pits throughout the county for use as aggregate and in the manufacture of concrete block.

Clinton.—Bituminous coal was mined from four underground mines and six strip mines, one less strip mine than in 1958. Strip mines used 18 power shovels and 8 draglines to produce 624,000 tons of coal. Only one cutting machine was used in the underground operations, and none of the production was mechanically loaded. Only 26 percent was mechanically cleaned.

Lycoming Silica Sand Co. crushed and sized limestone for use as concrete aggregate, roadstone, and railroad ballast. Most of the stone was transported by truck and the remainder by railroad.

Miscellaneous clay mined under contract for Mill Hall Clay Products, Inc. (Castanea) was used for manufacturing heavy clay products. Kelsey Mining Co. (Lock Haven) produced diaspore-type clay and sold it for manufacturing high alumina brick.

Columbia.—Output of anthracite declined. Anthracite was mined from strip pits, underground mines, and culm banks. Leading producers were: Raven Run Coal Co., Jeddo-Highland Coal Co., and Locustdale Mining & Contracting Co.

Bloomsburg Sand & Gravel Co. (Bloomsburg) recovered sand and gravel for use as building material.

Miscellaneous clay was recovered from an open pit near Mifflinville by The Alliance Clay Product Co., on property leased from Lloyd E. Eister. Output was used for making heavy clay products.

Crawford.—Sand and gravel produced by four operators was sold to local and State governments and local consumers for use as ready-mix and bituminous material, antiskid and fill material, and other building uses.

Cumberland.—Valley Quarries, Inc., Shippensburg; Hempt Bros., Inc., Camp Hill; and Locust Point Stones Quarries, Mechanicsburg all reported output of crushed limestone for use as concrete aggregate, roadstone, and screenings. In addition, the latter company produced some limestone for agricultural purposes. All the limestone was shipped by truck.

Three companies (Hempt Bros., Inc., C. & L. Goodhart, and R. A. Bender & Son) processed sand and gravel and sold it for building and road paving use.

Philadelphia Clay Co. mined kaolin from an open pit near Mount Holly Springs and crushed and sold the clay for making white portland and other hydraulic cements.

Dauphin.—Hempt Bros., Inc., Camp Hill; and George E. Ebersole & Sons, High Spire, quarried and crushed limestone solely for use as concrete aggregate and roadstone. In addition to producing limestone for road material, the Bethlehem Limestone Co., Steelton quarry, produced limestone for blast-furnace flux and railroad ballast. Crushed basalt for road material was produced near Elizabethville by Faylor Lime & Stone Co. Some of the stone was sold to the Pennsylvania Department of Highways for road construction.

Anthracite was mined at strip pits, and slightly smaller quantities were obtained from culm banks and underground mines.

Glen-Gery Shale Brick Corp. (Royalton and Harrisburg) produced shale for use in manufacturing building brick. Bethlehem Limestone Co., Steelton quarry (Steelton), produced miscellaneous clay marketed for use in making foundry refractories and protective coatings for underground pipelines.

The entire output of sand and gravel by Highspire Sand & Gravel Co., Ltd., (High Spire) and Pennsylvania Supply Co. (Amity Hall) was used for paving.

H. E. Millard Lime & Stone Co. burned hydrated lime at its eight-shaft-kiln Swatara plant near Hershey. Output was sold for agricultural purposes.

Delaware.—Delaware County was by far the leading basalt producing county in the State, with tonnage showing a slight decrease and value a slight increase. V. DiFrancesco & Sons, Freeborn quarry (Havertown), Llanerch quarry and crusher (Llanerch), and General Crushed Stone Co., Glen Mills quarry produced and crushed basalt for concrete aggregate and roadstone. Dimension sandstone for rough construction was quarried by Media Quarry Co. (Media). Carl Galantino, Inc., quarried dimension miscellaneous stone used as rough and dressed construction stone and rubble. Di-Bonaventura Quarries, Inc., quarried dimension miscellaneous stone for use as rough and dressed construction stone. Three granite quarries near Lima, Broomall, and Swarthmore yielded dimension granite chiefly for use as rough and dressed construction stone, rough architectural stone, and rubble.

Perlite Products Corp. expanded perlite at its Primos plant. The material was sold or used chiefly as a building plaster aggregate and as a mix with asphalt for insulating material.

Elk.—Bituminous coal was produced at 19 underground mines (16 in 1958), 7 strip mines (8 in 1958), and 2 auger mines (3 in 1958). Slightly more coal was produced from underground operations than from strip mines. Of the coal mined underground, 88 percent was cut by machine and 77 percent was mechanically loaded. Of the total county production, only 8 percent was mechanically cleaned; wetwashing methods were used.

Saint Mary's Sewer Pipe Co. mined plastic fire clay near Saint Marys. Output was used by the company for making vitrified sewer pipe.

Stone Haven Mix (Johnsonburg) prepared paving gravel for use on local and State government projects.

Speer Carbon Co. (St. Marys) manufactured graphite (artificial) for use by major steel and chemical companies.

Erie.—Four companies reported output of sand and gravel. Output increased 73 percent over 1958. Processed material was transported from plants by rail and truck.

Reed-sedge and humus peat were recovered from a bog in the southeastern area of the county (near Corry) by Corry Peat Products Co.

Fayette.—Bituminous coal was produced at 41 underground mines, (35 in 1958); 31 strip mines (30 in 1958); and no auger mines (1 in 1958). Forty-nine cutting machines and 43 loading machines were used at the underground operations, with 95 percent cut by machines and 77 percent loaded mechanically. Three draglines, 35 power shovels, and 29 bulldozers were used at the strip operations. Thirty-four percent of the total production from all mines was mechanically cleaned, using both wetwash and pneumatic methods.

Vesco Corp. crushed, ground, and sized limestone recovered from the Lake Lynn quarry and marketed the stone for road material, dust for coal mines, and agricultural purposes. Connellsville Bluestone Co. quarried and crushed sandstone (bluestone) near Scottdale for road material. General Refractories Co. produced crushed and ground ganister rock at the Childs quarry and plant near Layton for making silica brick.

Although the number of operations decreased from four to three, production from open-pit clay operations increased. Plastic and flint fire clay was sold or used for making firebrick and block; miscellaneous clay was sold or used mainly for building brick. Pits were near Ohiopyle, Uniontown, and Layton.

McClain Sand Co., Inc., transported prepared sand and gravel by railroad, truck, and waterway. Part of the prepared gravel was shipped across the State line for use by the West Virginia State agency.

Forest.—Tionesta Sand & Gravel, Inc., sold washed, screened, or otherwise prepared sand and gravel from a stationary plant at Tionesta.

Franklin.—Six active producers reported output of limestone from seven quarries near Shippensburg, Williamson, Zullinger, Chambersburg, and Dry Run. The limestone was used chiefly for concrete aggregate and roadstone. Smaller quantities were sold for use as railroad ballast and for agricultural purposes.

Combined output of three sand companies increased slightly. Sand was washed, screened, or otherwise prepared for building purposes.

Quicklime, solely for agricultural lime, was burned at the 3-shaft-kiln plant of Frank L. Heinbaugh near Mercersburg.

Fulton.—H. B. Mellot Estate, Inc., operated the Charleton quarry and plant (Warfordsburg), producing crushed and broken limestone for use as concrete aggregate, roadstone, and for agricultural purposes. The company's Morton quarry near Big Cove Tannery was idle, but limestone was sold from stock as road material. John P. Martz & Son quarried and crushed limestone solely for manufacturing lime at its Martz Draw kiln near Hustontown.

H. B. Mellot Estate, Inc., processed only sand, near McConnellsburg, for use as building and paving sand by contractors and other users.

Greene.—Greene was the leading county in the production of bituminous coal from underground mines; production totaled 9.6 million tons. Nineteen underground mines were active in 1959, 3 less than in 1958. All but a small fraction of the underground production was cut by machine and loaded mechanically. Three strip mines also were active, using 2 power shovels and 3 bulldozers. Seventy-six percent of the county production was mechanically cleaned, using jigs, other wet methods, and pneumatic procedures.

Huntingdon.—Huntingdon County ranked third in the value of sand and gravel produced in the State. With Alexandria Fire Clay Co. making only a small shipment from stock in 1959, Pennsylvania Glass Sand remained the sole producer of industrial and ground sands.

Limestone recovered from the Orbisonia and McConnellstown operations of New Enterprise Stone & Lime Co. was crushed for use as concrete aggregate and roadstone. The Union Furnace quarry and plant of Warner Co., Bellefonte Division (Union Furnace), produced crushed limestone for use as concrete aggregate, roadstone, and riprap. Tyrone Lime & Stone Co., a former operator in the county, sold its Stover No. 1 quarry in the summer of 1958. North American Re-

fractories Co. (Three Springs) and Harbison-Walker Refractories Co. (Mount Union) quarried and crushed quartzite for making silica brick at the local company plants.

A total of 62,000 short tons of bituminous coal was produced at nine underground mines (seven in 1958) and five strip mines (four in 1958). Only 22 percent of the underground tonnage was cut by machines and 6 percent mechanically loaded. Three power shovels and one dragline were used at the five strip mines. None of the production from underground mines or strip mines was mechanically cleaned.

Plastic fire clay, sold for making refractory mortar, was recovered near Alexandria.

Indiana.—Production from 83 underground mines, 33 strip mines, and 3 auger mines totaled 6.2 million tons of bituminous coal. Indiana was the third-ranking producer of coal from underground mines. One hundred and forty-two cutting machines and loading machines were used. Virtually all of the underground production was mechanically cut and loaded. At the 33 strip mines, 61 power shovels, 24 draglines, and 60 bulldozers were used. Sixty-five percent of the total output was mechanically cleaned, using jigs, other wet methods, and pneumatic methods.

Hiram Swank's Sons, Inc., mined plastic fire clay from its No. 6 underground mine near Clymer. The material was used to make pouring-pit refractories.

Jefferson.—Bituminous coal was produced from 30 underground mines (39 in 1958), 29 strip mines (28 in 1958), and 4 auger mines (3 in 1958). At the underground mines, 81 cutting machines and 46 loading machines were used; 94 percent of the coal was mechanically cut, and 74 percent of the coal was mechanically loaded. Only 9 percent of the county production from underground, strip, and auger mines was mechanically cleaned. Only jigs were used to clean the coal.

Henry O'Neill & Co., at an underground mine near Brookville, produced flint fire clay marketed for use in making firebrick and block. The Brockway Clay Co. (Brockway) and Hanley Co. (Summerville) also operated underground mines but produced plastic fire clay used at the company plants to make building brick, tile, vitrified sewer pipe, and other heavy clay products.

Juniata.—W. N. Quigley quarried limestone and crushed it in a portable plant near Mifflin for use as road material. Juniata Limestone Co., McAllisterville, produced crushed limestone for road material and agricultural purposes. Both companies sold stone to local and nearby government agencies for road construction. Fulkroad Lime Quarry, McAllisterville, produced crushed limestone solely for use in manufacturing lime. Kaiser Aluminum & Chemical Corp. recovered quartzite and crushed and used it at the Van Dyke plant (Thompsontown) to manufacture silica brick.

Quicklime was produced at the 3-pot-kiln plant of Fulkroad Lime Quarry, McAllisterville. The lime was used for agricultural purposes on farms in Juniata, Snyder, and Perry Counties.

Lackawanna.—Output of anthracite increased slightly compared with 1958, but average value per short ton dropped from $9.62 in 1958 to $9.28 in 1959. Underground mines, strip pits, and culm banks were operated. Leading producers were Hudson Coal Co. and Moffat Coal Co.

Lancaster.—Production and value of dimension limestone remained the same. The limestone was produced mainly for use as rough construction stone. The tonnage and value of crushed and broken limestone increased 34 and 24 percent, respectively. Sixteen quarries and plants were operated by 14 companies near Gap, Rheems, Quarryville, Talmage, Lititz, Denver, Morgantown, Blue Ball, Salunga, Bareville, Bainbridge, Martindale, and East Petersburg. Leading producers were D. M. Stoltzfus & Son, Inc., Bradford Hills Quarry, Inc., and Ivan M. Martin, Inc. Most of the crushed stone produced was sold or used for concrete aggregate and roadstone; smaller quantities were used for agricultural purposes, stone sand, manufacture of lime, and asphalt fill. Much of the limestone was sold under contract to local and nearby government agencies for road construction, and some was sold for agricultural uses.

Anthracite was recovered by dredging operations.

Two companies, Milton Grove Sand, Inc. (Milton Grove) and Hempt Bros. (Elizabethtown), operating stationary plants, processed building sand, and A. T. Harris Sand Co. produced industrial sand at its Honey Brook plant.

The J. E. Baker Co. produced dead-burned dolomite as refractory material at its 2-rotary-kiln Billmeyer plant near Bainbridge. Quicklime for agricultural uses and hydrated lime as building lime were produced near Elverson by Amos K. Stoltzfus.

Whitaker Clay Co. mined plastic fire clay near Narvon and sold it for use in foundries and steelworks. Miscellaneous clay and shale were mined to make building brick by Glen-Gery Shale Brick Corp. (Ephrata) and Lancaster Brick Co. (Lancaster).

Mineral specimens and gem-quality stones were collected near Blue Ball and in Fulton Township. Included among the specimens and stones were eucryptite, hydromagnesite, goethite, calcite, pyrite, and malachite.

Lawrence.—Shipments and value of portland cement increased slightly (4 and 3 percent, respectively). Bessemer Limestone & Cement Co. utilized captive cement rock at its Bessemer plant to manufacture Types I–II air-entrained and non-air-entrained and some Type III non-air-entrained portland cement. Mortar cement also was produced. Three 235- x 10-foot rotary kilns and one 450- x 12-foot kiln were operated. Medusa Portland Cement Co. (Wampum) produced general-use and moderate heat, also high-early-strength portland cements and some masonry cement. Two 390- x 12-foot rotary kilns were operated. Shipments of cement were largely in bulk by truck, mainly to ready-mixed concrete companies and building material dealers.

Lawrence County dropped from third to fifth among the stone-producing counties. Five companies produced crushed limestone and cement rock, mainly for blast-furnace flux, cement, concrete aggregate, and roadstone. The stone was recovered from quarries near Bessemer,

Wampum, Hillsville, New Castle, and Mahoning Township. Most of the stone was transported by rail.

One underground bituminous coal mine (2 in 1958) and 28 strip mines (24 in 1958) were active in 1959. Thirty-eight power shovels, 18 draglines, and 25 bulldozers were used at the strip mines. None of the coal mined in Lawrence County was mechanically loaded.

Output of clay increased 19 percent in tonnage and 29 percent in value. Plastic fire clay and miscellaneous clay for building brick and other heavy clay products were produced at Enon Valley, Edinburg, New Castle, and Bessemer.

Sand and gravel recovered by Mahoning Valley Sand Co. was processed at the local plant for use as construction and paving material. Sand was produced for filtration and gravel for fill. Superior Sand & Supply Co. also produced sand and gravel.

D. M. Boyd produced humus peat from bogs near Leesburg. Moore's Humus & Nursery recovered reed-sedge peat at a bog in Washington Township.

Lebanon.—The Cornwall iron ore mine, 5 miles south of Lebanon, was operated by Bethlehem Cornwall Corp., a subsidiary of Bethlehem Steel Co. Mining was 98 percent by block caving and 2 percent by the open stope method. Crude ore was processed at the Lebanon concentrator by flotation, magnetic concentration, and agglomeration.

Lebanon County was second in lime production. H. E. Millard Lime & Stone Co. operated 4 rotary kilns and 1 continuous hydrator to produce quicklime and hydrated lime at its Annville plant. Some quicklime was sold for agricultural purposes, and quicklime and hydrated lime were sold for building, metallurgical, water purification, and papermaking uses. The company's Palmyra calcining plant was idle.

Four limestone quarries were operated by three companies. Crushed and broken stone was sold or used principally for use as concrete aggregate and roadstone, in the manufacture of cement and lime, and as open-hearth flux. Smaller quantities were sold for agricultural purposes and railroad ballast. Pennsylvania Aggregates, Inc., Cornwall, did not operate its quarry but sold limestone from a stockpile to local government agencies for use as road material. The Fiala, Inc., White Hall quarry and plant discontinued operations due to the depletion of its limestone deposit.

Anthracite was recovered by dredging operations.

Lehigh.—Although one less cement plant operated in the county (five in 1958), shipments increased slightly. General use, moderate heat, high-early-strength, air-entrained, and non-air-entrained portland cements were produced near Coplay, Cementon, Fogelsville, and Egypt. Some mortar cement also was produced. All the material was shipped by railroad, mostly in bulk. Giant Portland Cement Co., Egypt, completed a new closed-circuit ray-milling department. The old raw mills were being converted for use in cement finishing.

New Jersey Zinc Co. (Friedensville) mined crude zinc ore at its Friedensville underground mine. The room and pillar method was used. Zinc concentrate was shipped by truck about 25 miles to the company smelter at Palmerton.

Output of cement rock by Lehigh Portland Cement Co., Fogelsville; Giant Portland Cement Co., Egypt; The Whitehall Cement Manufacturing Co., Cementon; and Coplay Cement Manufacturing Co., Coplay, was crushed at local plants and utilized solely for manufacturing cement. Lehigh Stone Co., Ormrod, produced crushed and broken limestone for use as concrete aggregate and roadstone. Some of the stone was sold to nearby government agencies for road construction. Quarries of Lehigh Portland Cement Co. at Ormrod and Susquehanna Quarry at Allentown were not operated. Penn Big Ben Slate Co., Inc., Slatington, quarry No. 2, produced and processed slate chiefly for structural and sanitary uses, standard roofing, blackboards, and bulletin boards.

Linarite, jasper, corundum, chalcedony, and zinc mineral gem-quality specimens were collected.

Pennsylvania Perlite Corp. (Allentown) expanded perlite shipped from mines in Colorado. The material was marketed mainly as a building plaster aggregate.

Luzerne.—Luzerne County was second in anthracite production. Output totaled 6,158,000 short tons, of which 77 percent was shipped outside the producing region, 22 percent was sold to local trade, and 1 percent was consumed for colliery fuel. Strip pits, underground mines, and culm banks were operated. Leading producers were: Glen Alden Corp., Hudson Coal Co., and Jeddo-Highland Coal Co.

Six plants (five stationary and one portable) washed, screened, or otherwise prepared sand and gravel as building and paving material. Output of sand and gravel increased slightly over 1958. More than 25 percent of the output was purchased by governmental agencies.

Four sandstone producers operated quarries at Chase, Sweet Valley, White Haven, and in Jenkins Township. The output was crushed and sold or used as road material and riprap. Hayes Bros. Stone Co. (White Haven) discontinued business in 1958.

Luzerne County was the leading peat-producing area in the State, and output increased slightly. Blue Ridge Soil Pep Co. recovered humus peat from a bog near White Haven. Pennsylvania Peat Moss, Inc., produced reed-sedge, moss, and humus peat from bogs near White Haven.

Miscellaneous clay for making building brick was mined by Hazleton Brick Co. (Hazleton).

Lycoming.—Lycoming Silica Sand Co., Lime Bluff quarry (Muncy) and Pine Creek quarry (Jersey Shore) produced crushed and broken limestone for use as road material. In addition, limestone from the Pine Creek quarry was crushed for agricultural purposes. John T. Morgan (Slate Run), a former sandstone producer, discontinued business in 1958. Keystone Filler & Manufacturing Co., at its Sheddy quarry near Muncy, produced, crushed, and ground slate for use as flour. Callahan & Haines Stone Co. (Slate Run) produced dimension miscellaneous stone for flagging stone and rubble.

The production of J. A. Eck & Sons, Inc., and Lycoming Silica Sand Co. again placed Lycoming County third in sand and gravel output. In addition to the sand and gravel produced for paving and construction needs, sand was utilized as industrial sand.

Bituminous coal was produced from three underground and two strip mines. The entire production from underground mines was produced by hand methods. At the strip mines, 38 power shovels and 18 draglines were used. None of the coal produced was mechanically cleaned.

Tripoli (rottenstone) was quarried by Keystone Filler & Manufacturing Co. at the Sheddy quarry (Muncy) and by Penn Paint & Filler Co. at the Ramsey quarry (Antes Fort). The crude material was crushed, dried, and ground for use as an abrasive and filler.

McKean.—Fire clay was recovered from pits near Mount Jewett and Clermont for making refractories for foundries and steelworks and hot tops for steel mills. Shale for building brick and floor and wall tile was mined near Lewis Run.

Three strip mines produced 42,000 short tons of bituminous coal. Eight power shovels, 1 dragline, and 8 bulldozers were used in the strip mines. None of the coal produced was mechanically cleaned.

C. L. McGavern, Jr., recovered molding sand from an open-pit mine. The entire quantity was transported by truck.

Mercer.—Three underground and seven strip mines were active in 1959, with 92 percent of the bituminous coal coming from the strip mines. Five cutting machines and one loading machine were used in the underground mines; all of the output was cut by machine, and 23 percent was loaded mechanically. None of the coal was mechanically cleaned.

Four companies produced sand and gravel from pits near West Middlesex, Mercer, Sharon, and South Pymatuning Township. Most of the sand and gravel was washed and screened and used chiefly for building and paving material. Smaller quantities were used for fill sand and miscellaneous uses. Transportation to consumers was by truck.

The Rock Kastle quarry (north of Volant), operated by Welty M. Smeltzer, yielded dimension sandstone for building mantels. White Rock Silica Sand Co. (Greenville) quarried and crushed silica chiefly for use in foundries and as road material.

Mifflin.—Pennsylvania Glass Sand Corp. produced industrial sand at the Hatfield Works near McVeytown for grinding, polishing, glass-molding, engines, and other uses. Miller Silica Sand Co. (Burnham) and James R. Kline's Sons (Lewistown) processed building, molding, and engine sand. Railroads and trucks transported the sand to consumers.

Bethlehem Limestone Co. mined limestone for blast-furnace and open-hearth flux, road material, and railroad ballast from the Naginey quarry (Naginey). Honey Creek Lime Co. (Reedsville) and Ehrenzeller Lime Co. (McVeytown), produced and crushed limestone for use in manufacturing lime. Haws Refractories Co. mined quartzite at the Hawstone quarry (Hawstone) and used it at the company plant for manufacturing silica brick.

Honey Creek Lime Co. (Reedsville) produced and sold hydrated lime for agricultural purposes, operating a 10-pot kiln and a continuous hydrator. Ehrenzeller Lime Co. burned and sold quicklime as agricultural lime at its 7-draw-kiln plant near McVeytown.

Monroe.—Hamilton Stone Co. produced crushed limestone at its Bossardsville quarry and plant for use in manufacturing lime and as an asphalt filler. Some of the stone was sold to the Pennsylvania Department of Highways for road construction.

The combined output of structural sand and gravel prepared by Steward White & Clyde White (Stroudsburg) and Sheesley Minerals, Inc. (Kunkletown) was transported by truck to consumers.

Various crystal gem specimens were collected, principally near Stroudsburg.

Montgomery.—Allentown Portland Cement Co. produced Types I-II general-use and moderate-heat, also air-entrained, and non-air-entrained portland cements and masonry cement from captive limestone and cement rock at its No. 2 plant at West Conshohocken. Three rotary kilns were operated. The material was shipped by rail, mostly in bulk, chiefly to ready-mix concrete companies.

Montgomery County continued to rank second among the stone-producing counties in the State. Tonnage and value rose slightly. Two operators near Norristown and Conshohocken produced crushed and broken limestone for use as concrete aggregate and roadstone. Two quarries, operated near Bridgeport and Plymouth Meeting, yielded limestone chiefly for open-hearth and blast-furnace flux, concrete aggregate, road material, agricultural purposes, and cement and lime manufacture. Thirty-six percent of the stone was transported by rail, 59 percent by truck, and 5 percent by unspecified means. Montgomery Stone Co., Inc., Montgomeryville, produced dimension basalt as dressed structural stone and crushed basalt for road material. R. K. Kibblehouse quarried and crushed basalt for road material near Perkiomenville. Some of the stone was sold to local and nearby government agencies for road construction.

Irregular-shaped rough construction dimension sandstone was quarried by Wm. Bambi & Sons, Inc., (Norristown). Fire Stone Products Co. (Glenside) quarried dimension sandstone and crushed some for use as refractory lining in steel-producing furnaces. Irvin B. Gill (East Norriton Township) produced crushed sandstone for road material. Crushed and broken miscellaneous stone (argillite) was quarried near Harleysville by M. & M. Stone Co. and used for road material. Dimension miscellaneous stone (mica schist), for rough and dressed building stone, was quarried and marketed by A. Manero & Sons, near Glenside. The Hillcrest quarry north of Chestnut Hill, operated by Marcolina Bros., Inc., yielded dimension granite utilized by the company for use as rough construction stone.

Total production of lime rose 8 percent in tonnage and 25 percent in value. G. & W. H. Corson, Inc. (Plymouth Meeting) produced building lime, quicklime for refractories and chemical uses, and hydrated lime chiefly for chemical and industrial uses.

The Keller-Whilldin Pottery Co. (North Wales) clay pit was idle, but the company manufactured art pottery, flower-pots, and glaze slips from stocks of clay. Robinson Clay Product Co. (Pottstown) used its output of plastic fire clay and miscellaneous clay for making vitrified sewer pipe. Norristown Brick Co. (Norristown) produced miscellaneous clay for making building brick. Philadelphia Brick Co. (Trappe) used shale to manufacture draintile and flues.

Prepared structural sand was produced by William Bambi & Sons, Inc., at its stationary plant near Norristown.

Audubon, Miquon, and Eureka were the principal areas where gem stones and mineral specimens were found. Among the specimens collected were garnet, almandine, galena, quartz, calcite, pyrite, anglesite, and copper and lead minerals.

Crude perlite, from mines in Colorado, Utah, and Pennsylvania, was expanded by Refractory & Insulation Corp. (Port Kennedy) and Philip Carey Manufacturing Co. (Plymouth Meeting). The expanded material was marketed for use as a filler and insulation material.

Montour.—Lycoming Silica Sand Co. (Milton) quarried and crushed limestone for concrete aggregate, roadstone, and agricultural purposes. Mausdale Quarry Co. (Danville) quarried and crushed limestone for use as concrete aggregate and roadstone. Some of the stone was sold to local government agencies for road construction.

Northampton.—Northampton County remained the leading cement-producing area in the State. The quantity and value of cement, which had dropped the two previous years, increased 2 and 7 percent, respectively. Ten companies operated 12 plants, manufacturing cement from captive limestone and cement rock and from materials purchased from outside sources. General-use and moderate-heat, also high-early-strength, portland and masonry cements were produced. Most of the cement was shipped by rail, in bulk, mainly to ready-mix concrete companies and manufacturers of concrete products. Plant operations were near Martins Creek, Northampton, Stockertown, Bath, Sandts Eddy, Bethlehem, and Nazareth. Nazareth Cement Co. (Nazareth) added a new crushing plant which began operating in September. Keystone Portland Cement Co. (Bath) reportedly renovated four 250-foot kilns, purchased two new quarry shovels, and installed a new secondary crusher in the crushing plant. National Portland Cement Co. (Bethlehem) installed cement storage silos for direct loading into trucks.

Northampton County continued to be the leading stone-producing area in the State, with increases in tonnage and value of 4 and 7 percent, respectively. Twelve firms produced limestone and cement rock from 13 quarries: 4 near Nazareth, 2 near Northampton, 2 near Bath, 2 near Bethlehem, and 1 each near Martins Creek, Stockertown, and Sandts Eddy. Most of the limestone and cement rock was utilized at the company plants for manufacturing cement, as concrete aggregate, and as roadstone. Smaller quantities were used for railroad ballast and stone sand. Northampton continued as the leading slate-producing county in the State, and output remained virtually the same as in 1958. Slate was quarried at 11 operations: 6 near Pen Argyl, 2 near Bangor, and 1 each near East Bangor, Bath, and Windgap. The slate was processed and marketed chiefly for flagging stone, roofing slate, structural and sanitary uses, and blackboards and bulletin boards.

Output of prepared sand and gravel, chiefly as building and paving material, was reported by W. J. Lowe & Sons, Inc. (Bangor) and Houdaille Construction Materials, Inc. (Portland). All the material was shipped to consumers by truck.

Anthracite was recovered by dredging operations.

Small quantities of bowenite and linarite gem specimens were collected.

Northumberland.—Average value of anthracite dropped to $7.15 per short ton from $7.73 in 1958. Leading producers were Reading Anthracite Co. and Susquehanna Collieries Co. Strip pits, underground mines, and culm banks were active.

Output of clay remained about the same. Two clay operators near Watsontown used the miscellaneous clay and shale output to make building brick. Watsontown Mineral Products Co. (Watsontown) used its stock of miscellaneous shale as a filler in linoleum.

Limestone, quarried by Eugene Meckley at the Meckley's quarry near Herndon, was crushed and broken for concrete aggregate, roadstone, and agricultural purposes. Transportation of all stone was by truck.

Prepared industrial molding sand was reported by M. E. Wallace Co. (Danville). Structural and fill sand was prepared by Wilsons Sand Plant (Montandan).

Clyde Starook (Northumberland) burned quicklime for agricultural purposes in a pot kiln using anthracite as fuel. The lime was delivered to customers within a 50-mile radius.

Perry.—Limestone was quarried near Newport by Bradford Hills Quarry, Inc., and crushed for use as concrete aggregate and roadstone. Some of the stone was sold to local government agencies for road construction.

Philadelphia.—The Liberty Corp. dredged and prepared structural sand and gravel along the Delaware River near Philadelphia. Transportation to consumers was by barge.

A small quantity of dolomite was collected by a hobbyist for gem specimens.

Potter.—Penn Kress Flagstone Co., Inc., (Wharton) reported output of dimension sandstone for use as irregular-shaped construction stone, rough architectural blocks, and flagging stone. Carroll M. Winseck, a new producer in the county, reported output of dimension miscellaneous stone near Roulette for use as flagging and rough and dressed building stone.

Schuylkill.—Schuylkill again led all counties in output of anthracite, accounting for 38 percent of the State tonnage and value. Average value per short ton dropped to $8.16 from $8.64 in 1958. Leading producers were: Reading Anthracite Co., Gilberton Coal Co., Valley Stripping Corp., and Mammoth Coal Co. Underground mines, strip pits, and culm banks were operated.

Huss Contracting Co. produced crushed limestone at the Andreas quarry (Andreas) for use as concrete aggregate and road material. Some of the stone was sold to the Pennsylvania Department of Highways for road construction. Quartzite, quarried and crushed for use in manufacturing silica brick, was produced at the Andreas quarry (Andreas) by Harbison-Walker Refractories.

Paving and fire or furnace sand was recovered from a pit near Andreas by Refractory Sand Co., Inc.

Coaldale Mining Co., Inc., sold miscellaneous clay, from its pit near Coaldale, for use in making lightweight aggregate. Auburn Brick Co. used miscellaneous clay, from a pit near Auburn, for making building brick.

Snyder.—Dredging was the only method of obtaining anthracite.

Miscellaneous clay and shale from two pits near Beavertown and Paxtonville, was used in manufacturing building brick.

National Limestone Quarry, Middleburg, quarried and sold crushed limestone for road material and agricultural purposes. Carton L. Comfort quarried and crushed limestone near Mount Pleasant Mills for use in manufacturing lime. Quicklime for agricultural purposes was burned at the local company lime plant.

Somerset.—Somerset County again had the most active underground bituminous coal mines with 103 (12 less than in 1958). Underground production totaled 948,000 short tons; 82 percent was mechanically cut, and 49 percent was mechanically loaded, using 165 cutting machines and 82 loading machines. Approximately 11 percent of the county production was mechanically cleaned, using wetwashing and pneumatic methods. Eighty power shovels and 35 draglines were used to produce 1.1 million tons of strip coal at the 54 active mines. Two auger mines also were active.

Somerset County clay production and value increased 39 and 31 percent, respectively. Four companies produced fire clay from open pits for use at company-owned plants making building brick, firebrick and block, and refractories such as sleeves, nozzles, and stoppers.

Keystone Lime Co., Springs, quarried and crushed limestone for concrete aggregate, roadstone, and agricultural purposes. Somerset Limestone Co., Inc., Bakersville, quarried limestone for road material.

Small quantities of sand for various uses were recovered by Robert D. Shaulis and Boswell Sand Co. (both near Boswell).

Sullivan.—Anthracite was mined at strip pits, underground mines, and culm banks. Pastusic Bros. Coal Co., the leading producer, operated the White Ash Slope underground mine.

Susquehanna.—Dimension sandstone (bluestone) was recovered from eight quarries near Harford, Brooklyn Township, north of Nicholson, Lakeside, New Milford, and Givson. The principal use of the sandstone was for flagging stone. Some of the sandstone was used for rough and dressed construction stone and rubble. Keelor Supply Co., Inc., produced crushed sandstone, at the Bennett quarry near Clifford, for use as road material.

Susquehanna Quarry Co. produced and prepared structural gravel, at a pit and portable plant near Union Dale, for construction of a flood-control dam in the vicinity.

Tioga.—Five underground mines and nine strip mines produced bituminous coal, compared with five underground mines and three strip mines in 1958. Nine draglines and 15 power shovels were in use at the strip mines.

Dimension sandstone for use as flagging stone and rubble was quarried in Elk Township by Lyle R. Robinson.

Union.—Crushed limestone was produced by John L. Iddings, near Mifflinburg, and marketed as road material. Faylor Lime & Stone

Co., Winfield, quarried and crushed limestone for concrete aggregate, roadstone, and agricultural purposes.

Venango.—Production from 13 strip mines (1 less than in 1958) totaled 552,000 short tons of bituminous coal. Three draglines and 16 power shovels were used at the strip mines. Fifty-four percent of the coal mined was mechanically cleaned, using jigs.

Industrial Silica, Division of Pennsylvania Glass Sand Corp. recovered and processed industrial molding and fire or furnace sand near Utica. White City Sand & Gravel (south of Titusville) and Oil City Sand & Gravel Co. (Oil City) reported output of sand and gravel chiefly as building and paving material and fill gravel. Some of the material was sold to local government agencies for road stabilization.

Warren.—Sand and gravel was recovered by dredging along the Allegheny River near Starbrick by General Concrete Products Corp. The material was processed for structural and paving uses and shipped to consumers by truck. Nelson & Ellberg (Warren) produced building sand and gravel and fill gravel near Warren.

Washington.—Washington County led in total production and underground production of bituminous coal. Twenty-three underground mines (1 less than in 1958) were active in 1959; most of the coal was mechanically cut and mechanically loaded. Twenty-one strip mines produced 975,000 short tons of coal. Nine draglines, 41 power shovels, and 37 bulldozers were used at the strip mines. Ninety-four percent of the county production was mechanically cleaned, using wet-washing methods.

Miscellaneous clay and red shale recovered from two open pits near Washington, and one near Monongahela were used at local company plants for making building brick.

Wayne.—Sandstone (bluestone), quarried and crushed by Wayne Concrete & Sand Works, Inc., near Damascus and Lake Ariel, was used mainly as road material, with a smaller quantity used as riprap. W. R. Strong & Son and Paul Thompkins Estate quarried dimension sandstone mainly for use as flagging stone, dressed or cut stone, and rubble.

The Lake Ariel operation of Wayne Concrete & Sand Works was idle, but the company sold structural sand and gravel from its stockpile. Keystone Paving (Lake Ariel) produced and processed paving sand and gravel.

Wayne Peat Moss Co. recovered humus peat from bogs at the southern tip of the county near Gouldsboro.

A small amount of anthracite was mined. Most of the output was sold locally.

Westmoreland.—Fifty-nine underground mines (7 less than in 1958), 23 strip mines (6 more than in 1958), and 2 auger mines (1 more than in 1958) were active. A major portion of the bituminous coal mined underground was cut and loaded mechanically. A total of 24 power shovels and 2 draglines were used at the strip mines to produce 160,000 tons of coal.

Latrobe Construction Co. produced crushed basalt near Long Bridge as road material and for making concrete blocks. John C. Beaumont (Smithton) and Ray Branthoover (north of Belle Vernon) produced

dimension sandstone for rubble. Clayton H. Remaley (Export) and Eidemiller Enterprises, Inc., Blue Rock quarry (Lycippus) quarried and crushed sandstone as road material. Lynn's Quarry (north of Belle Vernon) yielded dimension miscellaneous stone for use as flagging stone.

Westmoreland Clay Products Co. (Youngwood), the only clay producer in the county, closed permanently because the Greensburg-By-Pass road was constructed through its property.

Wyoming.—Three sand and gravel operators near Falls, Tunkhannock, and Falls Township produced building and paving sand and gravel, gravel for fill, and engine sand. All the material was transported to consumers by truck.

J. G. Robinson Inc. reported output of dimension standstone (bluestone) for use as flagging.

York.—Medusa Portland Cement Co. remained the only cement producer. Six rotary kilns were operated at the York plant to produce waterproof white and gray portland cements and mortar cements. Eighty-one percent of the cement was shipped by rail, and the remainder by truck, mostly in bulk.

York County ranked third in the State in tonnage and value of stone production. Limestone was produced at nine operations: six near York, and one each near Mount Wolf, Wrightsville, and Thomasville. Most of the limestone was crushed and broken for use as concrete aggregate, roadstone, open-hearth and blast-furnace flux, agricultural purposes, cement and lime manufacture, and railroad ballast. Crushed and ground slate at the Delta open quarry and plant of The Funkhouser Mills, Division of The Ruberoid Co. was marketed as natural granules and flour.

Dead-burned dolomite for refractory material was produced at the York plant of J. E. Baker Co. Shipments were mostly to points in Pennsylvania, Maryland, and Delaware. Some of the dead-burned dolomite was exported to Canada, Venezuela, Chile, and Panama.

Production of sand and gravel increased considerably. Three producers, near York, York Haven, and Mount Wolf, produced mostly washed and screened building and paving sand and gravel. Most of the material was delivered to consumers by truck.

Production of clay decreased. Glen-Gery Shale Brick Corp., York Colonial Division (York) reported output of miscellaneous shale used for making building brick. The company's Spring Garden Division (York) operation remained idle.

Mica, processed by air separation, was sold for the following uses: Paint, rubber (mold lubricant), plastics, and welding rods. General Mining Associates (Glenville) was the only mica producer in the State.

Pennsylvania Perlite Corp. expanded perlite at its expanding plant at York.

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